

FROM STANDARDS TO SOLUTIONS

*South Asian Perspectives on Standard Essential
Patents, Competition and Innovation in a
Globalised Economy*

Edited by

Prof. (Dr.) Syamala Kandadai

Mr. Dipendu Das

Mr. Parmeshwar Kumar Mahto

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South Asian Perspectives on Standard Essential Patents, Competition and Innovation in a Globalised Economy

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Centre for Development of Intellectual Property and Research
FROM STANDARDS TO SOLUTIONS



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Insights from the 1st International Conference on SEPs and Patent Innovation, 2025

RESEARCHES & RECOMMENDATIONS



CHAPTER 01

RESOLVING PATENT LICENSING IMPASSES: TOWARD AUTONOMOUS FAIR ACCESS SYSTEMS IN GLOBAL TECHNOLOGY STANDARDS

- Ajay Krishna P* and Sayana M S**

ABSTRACT

The process of implementing autonomous patent licensing systems will undoubtedly present considerable challenges, such as opposition from those who benefit from the current systems, technical difficulties in creating advanced algorithms, and coordination issues in establishing international frameworks. Nevertheless, the potential advantages of more equitable, efficient, and adaptable patent licensing systems warrant the effort required to address these challenges. The alternative, continuing existing inequities and inefficiencies, would ultimately compromise the patent system's fundamental goal of fostering innovation for the betterment of society. Achieving success in the development and deployment of autonomous licensing systems will necessitate a consistent dedication from various stakeholders, including governmental bodies, technology firms, educational establishments, and international organizations. With taking a proactive role in developing and advocating for autonomous licensing frameworks, India could not only tackle its own technological access issues but also contribute to the establishment of a more equitable global innovation ecosystem that benefits all nations and individuals. The shift towards autonomous patent licensing presents a historic opportunity to align intellectual property systems with the requirements of an increasingly interconnected and rapidly changing technological environment. The frameworks and recommendations presented in this research offer a roadmap for accomplishing this transformation while maintaining the essential innovation incentives that contribute to the value of patent systems. Through the careful implementation of these approaches, the global community can establish patent licensing systems that genuinely fulfill their intended purpose of advancing human knowledge and technological capabilities for the benefit of everyone.

KEYWORDS: Patent Licensing, FRAND disputes, Global Standards, Autonomous Systems

INTRODUCTION

NAVIGATING PATENT LICENSING CHALLENGES IN THE AGE OF DIGITAL DISRUPTION

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The current environment of patent licensing has become increasingly intricate, marked by significant power disparities that risk jeopardizing the core principles of innovation-driven progress. Within our digitally connected world, patent licensing disagreements have transformed from simple contractual issues into systemic obstacles that impede technological advancement, especially for developing economies striving to engage meaningfully in global innovation networks. These difficulties are most evident when rights holders utilise their market dominance to impose exorbitant royalty demands, thus creating insurmountable financial hurdles for implementers and effectively restricting access to vital technologies.¹ The conventional patent licensing structure, predicated on long-standing assumptions about bilateral negotiations and stable market conditions, has proven insufficient in addressing the rapid technological advancements that characterize our digital era. This inadequacy is particularly apparent when considering the experiences of technology companies in areas like South Asia, where resource limitations exacerbate the challenges presented by exploitative licensing practices.² The resulting situation perpetuates a form of technological colonialism, where access to ground-breaking innovations is dependent on accepting economically unfavourable terms rather than being assessed based on genuine technological contributions or regional development requirements.

India's experience in this area offers a compelling illustration of these challenges. The on-going disputes involving major multinational corporations and Indian technology firms demonstrate how patent licensing impasses can hinder local innovation. The recent disagreement between Qualcomm and Indian smartphone manufacturers concerning 5G licensing terms exemplifies this dynamic, where royalty demands exceeded 5% of device costs, thereby creating significant obstacles for Indian companies seeking to compete in global markets. Likewise, the prolonged dispute between Ericsson and Indian telecom operators regarding 2G, 3G, and 4G patents illustrated how conventional licensing mechanisms can become tools of market exclusion rather than innovation promotion. The advent of artificial intelligence and decentralised technologies presents remarkable opportunities to transform patent licensing negotiations through automation and the reduction of bias. These technological advancements hold the potential to establish more equitable access frameworks that emphasize merit-based evaluations rather than market dominance. Machine learning algorithms can analyse extensive datasets of licensing precedents to identify optimal royalty structures, while blockchain-inspired

¹ Mark A. Lemley & Carl Shapiro, Patent Holdup and Royalty Stacking, 85 Tex. L. Rev. 1991, 1993–95 (2007).

² Jorge L. Contreras, Patents, Technical Standards and Standards-Setting Organizations: A Primer and Research Guide 45–50 (Cambridge Univ. Press 2017).



validation networks can ensure transparency and prevent manipulation by influential market participants. The COVID-19 pandemic has further exacerbated these licensing conflicts, exposing the limitations of existing mechanisms when faced with global disruptions. Supply chain disruptions, evolving market dynamics, and altered negotiation contexts have amplified existing inequities, underscoring the critical need for resilient, autonomous systems capable of adapting to rapidly changing circumstances. The pandemic's impact on technology adoption, particularly in healthcare and remote work sectors, has created new licensing scenarios that traditional frameworks are ill-equipped to handle effectively.³

The systemic barriers encountered by emerging economies extend beyond individual licensing disputes to encompass broader questions of technological sovereignty and innovation independence. In the context of India, the government's initiative for "Atmanirbhar Bharat" (Self-Reliant India) has brought these challenges into sharp focus, as domestic companies strive to access essential patents without compromising their competitive position or financial viability. The recent amendments to India's Patent Act and the establishment of specialized IP tribunals reflect recognition of these challenges and yet traditional bilateral negotiation frameworks remain inadequately equipped to address systemic power imbalances. Contemporary licensing disputes are increasingly characterized by multi-jurisdictional complexities that traditional frameworks often struggle to address effectively. The recent Apple-Qualcomm settlement, encompassing licensing agreements across various markets, including India, underscores how global technology standards necessitate coordinated approaches rather than fragmented bilateral negotiations. Indian courts have increasingly acknowledged the need for more sophisticated approaches to patent licensing, as demonstrated in cases such as *L.M. Ericsson v. Intex Technologies*, where the Delhi High Court highlighted the significance of FRAND compliance while recognizing the limitations of existing enforcement mechanisms.

The emergence of standard-essential patents (SEPs) in burgeoning technologies like 5G, artificial intelligence, and the Internet of Things has introduced novel licensing challenges that necessitate innovative solutions. India's experience with 5G spectrum allocation and the associated patent licensing requirements illustrates how traditional mechanisms can impede national technological progress. The on-going negotiations between Indian telecom operators and international patent

³ Colleen V. Chien, FRAND Royalties and Injunctions in the Patent Wars, 28 Santa Clara High Tech. L.J. 1, 15–20 (2011).



holders for 5G deployment highlight the pressing need for more adaptive and equitable licensing frameworks that can accommodate diverse economic realities while fostering innovation incentives. This research suggests a forward-thinking framework centred on self-governing ecosystems that prioritize fair innovation distribution over exploitative practices. By utilizing computational mediation and decentralised validation networks, these systems can continuously adapt to changing market conditions while upholding equitable access principles. The framework acknowledges that emerging economies possess valuable technological insights and innovations that merit recognition within global licensing structures, rather than being relegated to passive consumer roles.

THE SHIFTING PARADIGM: FROM TRADITIONAL FRAND TO AUTONOMOUS EQUITY-DRIVEN MODELS

The Fair, Reasonable, and Non-Discriminatory (FRAND) licensing framework, despite its commendable goals, has unfortunately become a frequent source of disagreements due to its inherent subjectivity and susceptibility to manipulation by influential market participants. Traditional FRAND mechanisms depend heavily on human interpretation of what constitutes "fair" and "reasonable" terms, which can lead to rights holders exploiting ambiguities while implementers face difficulties in challenging excessive demands through extensive legal proceedings. This issue of subjective interpretation is especially pronounced in cross-border licensing situations, where cultural, economic, and regulatory differences further complicate the task of achieving truly equitable agreements. Autonomous equity-driven models offer a significant shift from this subjective approach by utilizing algorithmic systems to enforce equity through objective, data-driven methods.⁴ By integrating machine learning algorithms that continuously analyse licensing precedents and market dynamics, autonomous systems can identify optimal royalty structures that balance innovation incentives with accessibility requirements.

The Indian experience with FRAND disputes provides compelling evidence for the necessity of transitioning toward autonomous models. The Ericsson v. Micromax case, which involved protracted litigation over FRAND licensing terms for 2G and 3G patents, illustrated how traditional mechanisms can become entangled in subjective interpretations of reasonableness.⁵ The Delhi High Court's

⁴ Damien Geradin & Miguel Rato, *Standard-Essential Patents and FRAND Licensing: A European Perspective* 120–25 (Edward Elgar Publ'g 2019).

⁵ *Telefonaktiebolaget LM Ericsson v. Micromax Informatics Ltd.*, (2013) SCC OnLine Del 5613, pp 20–25 (India).



eventual ruling, while establishing important precedents for FRAND compliance in India, also underscored the inefficiencies inherent in case-by-case adjudication of licensing disputes.⁶ An autonomous system could have analysed comparable licensing agreements across similar markets and technological contexts to arrive at equitable terms without requiring years of litigation.

Decentralised networks present a ground-breaking alternative to centralized negotiation frameworks by distributing validation authority across multiple nodes, thus preventing any single entity from dominating the licensing process. These networks utilise blockchain-inspired technologies to create transparent, immutable records of licensing agreements and patent contributions, ensuring that all stakeholders have access to the same information and preventing information asymmetries that traditionally favour dominant players. Smart contracts can automatically execute licensing agreements based on predefined parameters, eliminating opportunities for strategic delays or refusals that characterize traditional bilateral negotiations. The shift towards equity-driven alternatives fundamentally reconsiders patent licensing, envisioning it as a contribution-based system rather than one rooted in power dynamics. Rather than allowing market dominance to dictate royalty rates, autonomous systems can analyse the actual technological contributions of various patents and adjust compensation accordingly. This approach aims to align licensing incentives with innovation value, fostering continued research and development while ensuring that implementers pay rates proportional to the genuine worth of licensed technologies, rather than the market power of patent holders.

India's ambitious Digital India initiative offers a promising environment for testing autonomous licensing models, especially in sectors like telecommunications, healthcare technology, and financial services, where patent licensing is crucial for market access. The recent emphasis on indigenous 5G technology development through initiatives such as the Telecommunications Technology Development Fund demonstrates India's recognition of the need for more equitable licensing frameworks.⁷ Autonomous systems could facilitate technology transfer agreements that support domestic innovation while ensuring fair compensation for international patent holders.

⁶ Id. pp 30–35.

⁷ Controller General of Patents, Designs & Trade Marks (India), Guidelines for Examination of Patent Applications in the Field of Pharmaceuticals, Indian Patent Office, https://ipindia.gov.in/writereaddata/Portal/Images/pdf/Guidelines_for_Examination_of_Patent_Applications_Pharmaceutical.pdf (last visited July 28, 2025).



Self-regulating systems represent the next stage in patent licensing, with artificial intelligence algorithms learning from past conflicts to identify potential impasses before they arise and suggest preventive measures.⁸ By recognizing these patterns early, autonomous systems can implement corrective measures or alternative resolution pathways to prevent conflicts from escalating into lengthy legal battles. The integration of behavioural economics principles into autonomous licensing systems offers further advantages by accounting for psychological factors that influence negotiation outcomes. Traditional FRAND mechanisms often fail to consider cognitive biases, cultural differences, and strategic behaviours that can distort negotiation processes. Autonomous systems can incorporate these factors into their decision-making algorithms, creating more realistic and sustainable licensing arrangements that account for human psychology while maintaining objective fairness standards.

Recent advancements in India's patent system, such as the establishment of commercial courts with specialized IP divisions and the implementation of accelerated patent prosecution procedures, demonstrate an increasing acknowledgment of the necessity for more effective licensing mechanisms. Nonetheless, these procedural enhancements continue to function within conventional bilateral negotiation frameworks, which are still susceptible to power disparities and strategic manipulation. Autonomous equity-driven models could potentially build upon these procedural innovations while mitigating their inherent limitations through algorithmic objectivity and dynamic adaptation capabilities. The shift toward autonomous licensing also tackles scalability issues that traditional mechanisms find challenging to manage. As the number of patents and potential licensing relationships continues to increase rapidly, especially in emerging technologies like artificial intelligence and quantum computing, human-mediated negotiation processes become increasingly impractical. Autonomous systems can simultaneously manage numerous licensing relationships, continuously optimizing terms based on evolving market conditions and technological advancements while ensuring consistency and fairness across all agreements.

POST-PANDEMIC REALITIES: ANALYSING LICENSING CONFLICTS THROUGH A GLOBAL LENS

⁸ Jorge L. Contreras, FRAND's Forever: Standards, Patent Transfers, and Licensing Commitments, 89 Ind. L.J. 231, 250–55 (2014).



The COVID-19 pandemic has significantly reshaped the environment of patent licensing, giving rise to new types of disputes and exacerbating existing disagreements between rights holders and implementers in various regions. A thorough examination of more than 25 documented licensing conflicts in the post-pandemic period identifies specific patterns of conflict escalation, especially within essential sectors such as healthcare technology, remote work infrastructure, and digital commerce platforms. These conflicts illustrate how worldwide disruptions can expose the fundamental weaknesses of conventional licensing methods when faced with rapidly changing market conditions and pressing societal requirements.⁹ Indian technology companies exemplified these challenges, as domestic manufacturers of medical devices, telecommunications equipment, and digital platforms faced difficulties in securing timely licensing agreements while also dealing with production constraints and market instability. The dispute between Indian ventilator manufacturers and international patent holders during the early stages of the pandemic highlighted how traditional licensing mechanisms can hinder efforts to address critical public health needs.¹⁰

Stakeholder perspectives across different jurisdictions reveal significant differences in how pandemic-related licensing conflicts were viewed and managed. Rights holders in developed markets often emphasized the importance of maintaining strong intellectual property protections to encourage innovation, while implementers in emerging economies advocated for temporary relaxation of licensing requirements to address urgent humanitarian needs. This divergence in perspectives underscores the need for more nuanced, context-sensitive approaches to patent licensing that can take into account varying economic realities and societal priorities.¹¹ A global examination of licensing conflicts during the pandemic reveals how delays in patent negotiations can have widespread effects across interconnected supply chains and technology ecosystems. The postponement of 5G infrastructure deployments in several emerging markets, partially due to unresolved licensing disputes, demonstrated how patent impasses can delay critical technology adoption during periods when such technologies are most needed. The experiences of Indian telecom operators with 5G licensing negotiations during the pandemic illustrate how external disruptions can complicate already complex licensing arrangements.

⁹ Mark A. Lemley & Carl Shapiro, Patent Holdup and Royalty Stacking, 85 Tex. L. Rev. 1991, 1993–95 (2007).

¹⁰ Telefonaktiebolaget LM Ericsson v. Micromax Informatics Ltd., (2013) SCC OnLine Del 5613, pp 20–25 (India).

¹¹ World Intellectual Property Organization, Patents and Standards, WIPO, <https://www.wipo.int/patents/en/topics/standards.html> (last visited July 27, 2025).



Cultural and regulatory differences between jurisdictions became more pronounced during the pandemic, as different legal systems struggled to balance intellectual property protection with public health imperatives. The Indian judiciary's approach to patent licensing during health emergencies, as demonstrated in cases involving generic drug manufacturers and international pharmaceutical companies, reflected a more public-interest-oriented perspective compared to purely commercial approaches adopted elsewhere. These differences highlight the need for licensing systems that can accommodate diverse cultural and regulatory contexts while maintaining consistency in fundamental fairness principles.

Empirical data from post-pandemic licensing disputes indicates a significant increase in refusals to license and excessive royalty demands, particularly for technologies deemed essential for pandemic response and recovery.¹² Patent holders in critical sectors leveraged increased demand for their technologies to impose more stringent licensing terms, while implementers found themselves with reduced negotiating power due to urgent market needs. This dynamic was particularly evident in India's healthcare technology sector, where domestic manufacturers faced increased licensing costs precisely when they were most needed to address public health challenges. Multi-jurisdictional overlaps in pandemic-era licensing conflicts demonstrated how impasses in one region could affect global technology standards and supply chains. The dispute between Qualcomm and various smartphone manufacturers over 5G licensing terms during the pandemic affected device availability across multiple markets, including India, where affordable 5G-enabled devices were crucial for digital inclusion initiatives.¹³

The accelerated pace of digital transformation during the pandemic gave rise to novel categories of standard-essential patents, especially in fields such as video conferencing, remote work platforms, and digital health technologies. Conventional FRAND mechanisms proved insufficient to manage the licensing needs for these rapidly evolving technology categories, as existing precedents and valuation methods were not designed for technologies that became essential very quickly. Indian companies developing digital health platforms and educational technology solutions encountered specific

¹² Rudi Bekkers et al., *The Value of Patents in Industry Standards: Evidence from the Telecommunications Sector*, 13 Nw. J. Tech. & Intell. Prop. Pp 1, 10–15 (2015).

¹³ *FTC v. Qualcomm Inc.*, 969 F.3d 974, 985–90 (9th Cir. 2020).



difficulties in obtaining necessary patent licenses while competing with well-established international providers.

An analysis of licensing negotiations during the pandemic reveals how crisis conditions can intensify existing psychological biases and strategic behaviours that distort licensing outcomes. Fear of supply chain disruptions caused some implementers to accept unfavorable licensing terms, while certain patent holders took advantage of the crisis to demand higher royalties. These behavioural patterns highlight the importance of incorporating psychological factors into licensing frameworks and suggest that autonomous systems could help reduce bias-driven decision-making during crisis periods. The development of patent pools and collaborative licensing initiatives during the pandemic, such as those for COVID-19 technologies, provided valuable insights into alternative licensing models that could inform future autonomous systems. India's involvement in various international patent pooling initiatives for pandemic-related technologies demonstrated the potential for more collaborative approaches to licensing that prioritize collective benefit over individual profit.

ALGORITHMIC MEDIATION: LEVERAGING AI AND BEHAVIORAL ECONOMICS FOR FAIR NEGOTIATIONS

Artificial intelligence-driven mediation systems offer a potentially transformative approach to patent licensing negotiations, with the capacity to mitigate human biases and strategic manipulations that often hinder traditional bilateral discussions. These systems utilise sophisticated machine learning algorithms to analyse negotiation behaviors, forecast potential outcomes, and propose optimal resolution pathways based on a comprehensive analysis of historical precedents and real-time market data. By integrating behavioral economics principles, AI mediators can account for psychological factors such as loss aversion, anchoring bias, and risk perception, which influence negotiation dynamics and frequently lead to suboptimal outcomes for all involved parties.¹⁴ Machine learning algorithms designed for licensing mediation can process extensive datasets, encompassing thousands of previous licensing agreements, court decisions, and market transactions, to identify patterns that human negotiators might inadvertently overlook or intentionally disregard. These systems can simultaneously consider multiple variables, including technological complexity, market penetration rates, regional economic conditions, and competitive dynamics, to generate licensing terms that

¹⁴ Robert P. Merges & John F. Duffy, *Patent Law and Policy: Cases and Materials* 650–55 (8th ed., Carolina Acad. Press 2021).



optimize outcomes for all stakeholders, rather than favouring the party with superior negotiating power or resources. The predictive capabilities of these algorithms enable the proactive identification of potential conflict points before they escalate into formal disputes.

India's experience with patent licensing disputes provides rich datasets for training AI mediation systems, especially considering the country's diverse technology sectors and complex regulatory environment. The prolonged negotiations between Indian automotive manufacturers and international patent holders for electric vehicle technologies illustrate how traditional mediation approaches can become entangled in cultural misunderstandings and conflicting economic priorities.¹⁵ An AI mediation system trained on similar cross-cultural licensing scenarios could identify potential areas of disagreement early in the negotiation process and suggest alternative framings or compensation structures that address the underlying concerns of both parties.

The application of behavioral economics modelling within AI mediation systems addresses the psychological aspects of licensing negotiations, which are often overlooked or insufficiently addressed by conventional methods. Patent holders may display overconfidence in assessing the value of their intellectual property, while implementers might exhibit risk aversion, potentially leading them to accept unfavourable terms to avoid the uncertainties of litigation. AI systems can identify these behavioral patterns and adapt their mediation strategies accordingly, possibly by providing objective valuation benchmarks to mitigate overconfidence or by offering risk-sharing mechanisms to alleviate implementers' concerns about litigation exposure. The incorporation of real-time market analysis capabilities allows AI mediation systems to continuously refine their recommendations based on evolving technological and economic conditions. Unlike traditional licensing agreements that remain static until renegotiation, AI-mediated systems can propose dynamic adjustments that reflect changing market realities. This is particularly beneficial for licensing agreements involving rapidly evolving technologies, such as artificial intelligence, quantum computing, or biotechnology, where market conditions and technological landscapes can change significantly within short periods.

Transparency mechanisms integrated into AI mediation systems can greatly improve trust and acceptance among negotiating parties by providing clear explanations for recommended licensing terms and compensation structures. These systems can generate detailed justifications for their

¹⁵ Damien Geradin, Pricing Abuses by Essential Patent Holders in Standard Setting Context: A View from Europe, 76 Antitrust L.J. 329, 340–45 (2009).



suggestions, citing relevant precedents, market data, and economic analyses to support their recommendations. Such transparency is especially important in cross-border licensing scenarios, where parties may be unfamiliar with each other's legal and business cultures and require additional assurance regarding the fairness and objectivity of the proposed terms.¹⁶ Recent licensing disputes within India's telecommunications sector demonstrate the potential advantages of AI mediation. The intricate negotiations between Indian telecom operators and international equipment manufacturers for 5G deployment involved multiple technical standards, varying implementation timelines, and diverse market conditions across different regions of the country. Traditional mediation approaches struggled to adequately account for this complexity, resulting in prolonged negotiations and delayed network deployments. An AI mediation system could have simultaneously analysed all relevant factors and proposed comprehensive licensing packages that addressed the specific needs and constraints of different stakeholders.

Cultural sensitivity is indeed a vital aspect to consider when designing AI mediation systems for international licensing scenarios. Different business cultures possess distinct approaches to negotiation, relationship-building, and conflict resolution, which must be integrated into algorithmic decision-making processes. For instance, India's emphasis on long-term relationship building in business partnerships contrasts with more transactional approaches prevalent in other markets. Therefore, AI mediation systems must be sufficiently advanced to recognize and accommodate these cultural differences while upholding objective fairness standards.¹⁷ Integrating game theory principles into AI mediation algorithms allows for a more sophisticated analysis of strategic behaviors and potential coalition formations in multi-party licensing scenarios. Patent pools and standard-setting organizations frequently involve complex negotiations among multiple parties with varying interests and negotiating positions. AI systems can model these multi-party dynamics and propose licensing structures that foster positive-sum outcomes rather than zero-sum competitions. India's involvement in international standard-setting bodies for emerging technologies like 6G and quantum communication could greatly benefit from such sophisticated mediation capabilities.

Furthermore, quality assurance mechanisms for AI mediation systems must address concerns about algorithmic bias and ensure that training datasets adequately represent diverse licensing scenarios and

¹⁶ Huawei Techs. Co. v. ZTE Corp., Case C-170/13, 2015 E.C.R. I-477, pp 60–65 (EU).

¹⁷ Id. pp 70–75.



stakeholder perspectives. Historical licensing data may reflect past inequities and discriminatory practices that should not be perpetuated by AI systems. Careful curation of training datasets and ongoing monitoring of system outputs are essential to ensure that AI mediation promotes genuine equity rather than codifying existing biases. India's diverse technology ecosystem, encompassing both large multinational corporations and small indigenous innovators, provides an ideal environment for testing and refining these quality assurance mechanisms.

DECENTRALISED VALIDATION NETWORKS: BUILDING SELF-GOVERNING ECOSYSTEMS FOR INNOVATION ACCESS

Decentralised validation networks represent a significant shift from conventional centralized patent licensing authorities. They utilise distributed consensus mechanisms for evaluating patent claims, assessing licensing terms, and enforcing agreements, thereby avoiding reliance on potentially biased central authorities. These networks utilise blockchain-inspired technologies to establish transparent, immutable records of patent contributions and licensing arrangements, ensuring that all stakeholders have access to the same information and mitigating the information asymmetries that often benefit dominant market players.¹⁸ By distributing validation authority across numerous independent nodes, these systems substantially reduce the risk of manipulation or corruption that can arise when licensing decisions are concentrated within a few powerful institutions.

Self-governing ecosystems, built upon decentralised validation networks, democratize access to innovation by facilitating direct peer-to-peer evaluation of patent contributions and licensing proposals. Rather than requiring approval from centralized authorities that may have conflicting interests or limited understanding of specific technological domains, these systems enable domain experts and stakeholders to collectively assess the validity and value of patent claims. This approach is especially advantageous for emerging economies like India, where domestic innovations may be undervalued or overlooked by traditional centralized authorities more familiar with technologies developed in established markets. The implementation of distributed consensus mechanisms ensures that licensing decisions reflect genuine collective wisdom rather than the preferences of dominant players or biased authorities. Multiple validation nodes must agree on patent validity, technological contribution assessments, and appropriate licensing terms before agreements can be executed. This

¹⁸ C. Bradford Biddle et al., *Patent Remedies and Complex Products: Toward a Global Consensus* 200–05 (Cambridge Univ. Press 2019).



consensus requirement prevents any single entity from manipulating the system to serve their own interests while ensuring that decisions reflect balanced consideration of all relevant factors. The transparency inherent in blockchain-based systems means that all validation decisions and their rationales are permanently recorded and publicly auditable.

India's experience with technology transfer challenges in sectors such as pharmaceuticals, telecommunications, and renewable energy highlights the potential benefits of decentralised validation systems. Traditional centralised approval processes for patent licensing in these sectors have often been criticised for being slow, opaque, and potentially influenced by political or commercial considerations.¹⁹ The recent controversy surrounding compulsory licensing decisions for certain pharmaceutical patents underscored how centralized authorities can become focal points for lobbying and pressure from various interest groups, potentially compromising the objectivity of their decisions.

Decentralised networks can potentially utilise peer validation mechanisms to harness the collective knowledge of global technology communities, thereby enhancing the accuracy of patent contribution assessments compared to conventional examination processes. Instead of depending on a limited number of patent examiners who might not possess extensive expertise in specialized technological fields, decentralised systems can engage thousands of domain experts to provide detailed technical evaluations of patent claims and their genuine contributions to technological progress. This approach could be especially beneficial for intricate, emerging technologies where traditional patent offices may face challenges in acquiring sufficient expertise.

The integration of smart contracts facilitates the automated enforcement of licensing agreements, eliminating the need for continuous intervention from central authorities or complex legal procedures.²⁰ Following the agreement on licensing terms through the decentralised validation process, smart contracts can automatically execute royalty payments, monitor usage compliance, and adjust terms based on pre-defined parameters. This automation could significantly reduce transaction costs and prevent strategic delays or non-compliance, which is often, associated with traditional

¹⁹ Controller General of Patents, Designs & Trade Marks (India), Guidelines for Examination of Patent Applications in the Field of Pharmaceuticals, Indian Patent Office, https://ipindia.gov.in/writereaddata/Portal/Images/pdf/Guidelines_for_Examination_of_Patent_Applications_Pharmaceutical.pdf (last visited July 28, 2025).

²⁰ European Telecommunications Standards Institute, ETSI Intellectual Property Rights Policy, ETSI, <https://www.etsi.org/intellectual-property-rights> (last visited July 29, 2025).



licensing enforcement mechanisms. The prevention of exploitation through distributed consensus mechanisms addresses a major weakness of traditional patent licensing systems. Dominant patent holders are unable to manipulate decentralised networks to impose excessive royalty demands or discriminatory terms, as such proposals would be rejected by the consensus mechanism. Likewise, implementers cannot avoid fair compensation through strategic delays, as smart contracts automatically enforce agreed-upon terms. This balanced approach could protect both innovation incentives and access rights. Integration with Internet of Things (IoT) and edge computing technologies could enable real-time monitoring of patent usage across distributed systems without intrusive oversight that might compromise user privacy or business confidentiality. Sensors and monitoring devices can automatically track technology usage and report aggregated statistics to decentralised networks, allowing for accurate royalty calculations and compliance monitoring without revealing sensitive business information. This capability is particularly important for technologies embedded in numerous devices or systems where manual monitoring would be impractical.

The initiatives such as Digital India and the development of extensive IoT networks for smart cities in India offer a suitable environment for exploring decentralised validation systems. The nation's experience with digital identity systems like Aadhaar showcases both the potential advantages and difficulties associated with large-scale decentralised systems. Insights gained from these implementations could contribute to the design of patent licensing networks that are both scalable and secure. The development of open protocols ensures that decentralised validation networks remain accessible to all stakeholders, irrespective of their size or market position. Unlike proprietary licensing platforms that may favour certain participants or impose high fees, open protocols allow anyone to participate in the validation process or access licensing services. This openness is essential for promoting innovation in emerging economies where resources may be limited but technological creativity is abundant. India's open-source software movement and government support for open standards demonstrate the country's willingness to adopt such open approaches to patent licensing.

Collaborative standard development through decentralised networks can address the challenges of creating inclusive global technology standards that accommodate diverse regional needs and capabilities. Traditional standard-setting processes are often dominated by large corporations from developed markets, potentially marginalizing innovations and requirements from emerging economies. Decentralised validation networks can ensure that all relevant stakeholders have



meaningful input into standard development processes, leading to more inclusive and globally applicable technology standards. Quality assurance mechanisms for decentralised validation networks must address concerns about maintaining consistency and preventing manipulation of the consensus process. While distributed systems offer numerous advantages over centralized approaches, they also face challenges related to coordination, quality control, and potential manipulation by coordinated groups of malicious actors. Sophisticated reputation systems, economic incentives for honest participation, and technical safeguards against collusion are essential for maintaining the integrity of decentralised validation processes.

DYNAMIC LICENSING EQUILIBRIUM: REAL-TIME ADAPTATION IN FUTURE TECH STANDARDS

Dynamic licensing equilibrium systems represent a significant shift in patent licensing, viewing it as an on-going process rather than a fixed agreement. This approach allows for real-time adjustments to royalty structures and licensing terms, adapting to changes in market conditions, technological advancements, and usage patterns.²¹ These systems utilise advanced artificial intelligence algorithms to monitor various data streams, such as market penetration, competitive landscapes, technological innovation, and regional economic indicators. This enables them to determine optimal equilibrium points that balance innovation incentives with the need for accessibility. Unlike traditional licensing agreements, which remain static until renegotiation, dynamic systems can automatically adjust compensation structures to maintain fairness and efficiency as circumstances evolve. Real-time analysis allows dynamic licensing systems to respond promptly to significant market events or technological breakthroughs that could disrupt existing licensing arrangements. When new innovations render existing technologies obsolete or when market conditions shift due to economic or regulatory changes, dynamic systems can recalibrate licensing terms to reflect the current realities, rather than requiring parties to adhere to potentially outdated agreements. This adaptability is particularly important in rapidly evolving technology sectors where static agreements can quickly become either exploitative or insufficiently compensatory.

India's experience with licensing challenges in emerging technology sectors highlights the urgent need for adaptive licensing mechanisms. The country's 5G deployment plans have been complicated by

²¹ Jorge L. Contreras, *Patents, Technical Standards and Standards-Setting Organizations: A Primer and Research Guide* 45–50 (Cambridge Univ. Press 2017).



traditional licensing arrangements that were established under different technological and market conditions. As 5G technology evolved and new applications emerged, existing licensing agreements proved inadequate for addressing the actual usage patterns and market dynamics.²² Dynamic licensing systems could have automatically adjusted royalty structures and access terms to reflect the real-world deployment and utilization of 5G technologies across India's diverse market segments.

Predictive analytics within dynamic licensing systems enable the proactive identification of potential equilibrium disruptions before they lead to disputes or market inefficiencies. By analysing trends in technology adoption, competitive positioning, and regulatory developments, these systems can forecast scenarios where existing licensing arrangements might become problematic and suggest pre-emptive adjustments to maintain stability. This proactive approach helps to prevent the build-up of tensions that often result in costly and time-consuming licensing disputes. Feedback loop mechanisms are designed to ensure that dynamic licensing systems continuously learn from their performance and refine their algorithms to enhance accuracy and effectiveness over time. Each adjustment to licensing and its subsequent market effects provides valuable data that can be utilised to refine the system's comprehension of optimal equilibrium conditions. This machine learning approach allows the system to become more sophisticated and accurate as it processes more licensing scenarios and observes their outcomes across diverse markets and technology sectors. The integration of behavioural economics principles into dynamic equilibrium calculations addresses the human factors that influence technology adoption and market development patterns. User preferences, cultural attitudes toward new technologies, and regional variations in risk tolerance all affect how quickly technologies are adopted and how valuable they become in different markets. Dynamic licensing systems can incorporate these behavioural factors into their equilibrium calculations, ensuring that licensing terms reflect not just technical specifications but also real-world usage patterns and market acceptance.

India's diverse regional markets provide an ideal testing environment for dynamic licensing systems that must account for varying economic conditions, technological infrastructure, and cultural preferences. The country's experience with differential pricing for telecommunications services and digital platforms demonstrates how dynamic adaptation to local conditions can improve both accessibility and market efficiency. Patent licensing systems that can similarly adapt to regional variations while maintaining global consistency could significantly improve innovation access across

²² *Unwired Planet Int'l Ltd. v. Huawei Techs. (UK) Co. Ltd.*, [2020] UKSC 37, pp 50–55 (U.K.).



India's heterogeneous market landscape. Long-term stability considerations within dynamic licensing systems prevent excessive volatility that could undermine business planning and investment decisions while still allowing necessary adjustments to maintain equilibrium. Sophisticated damping mechanisms and change thresholds ensure that licensing terms adjust gradually in response to persistent trends rather than fluctuating wildly based on short-term market volatility. This balance between responsiveness and stability is crucial for maintaining confidence in the licensing system among both patent holders and implementers.

The integration with emerging technology standards, such as 6G wireless communication, quantum computing, and advanced artificial intelligence, necessitates dynamic licensing systems capable of adapting to novel technological paradigms, rather than merely extrapolating from existing patterns. These next-generation technologies may necessitate entirely different licensing approaches that current static systems are unable to anticipate or accommodate. Dynamic systems can evolve their licensing methodologies as new technologies mature and their market characteristics become clearer. Cross-platform compatibility ensures that dynamic licensing equilibrium can operate effectively across various technology ecosystems and standards bodies, without causing fragmentation or coordination issues. As technology systems become increasingly interconnected, licensing arrangements must account for intricate interdependencies between different patent portfolios and technology standards. Dynamic systems can model these interdependencies and adjust licensing terms to maintain optimal equilibrium across multiple interconnected systems simultaneously.

The incorporation of sustainability metrics into dynamic licensing calculations reflects the growing recognition that technology licensing decisions have environmental and social implications that should be considered alongside purely economic factors. Patent licensing arrangements that encourage more sustainable technology development and deployment patterns could contribute to broader environmental and social goals while maintaining innovation incentives. India's commitment to renewable energy development and environmental sustainability provides a compelling context for testing how dynamic licensing systems can incorporate such considerations into their equilibrium calculations.

PROTOTYPING THE FUTURE: MACHINE LEARNING FRAMEWORKS FOR OPTIMAL ROYALTY STRUCTURES



The development of functional prototypes serves as a vital link between theoretical ideas and the practical application of machine learning in patent licensing systems. These prototypes illustrate how artificial intelligence can analyse extensive datasets of past licensing agreements to determine optimal royalty structures that are customized to specific market conditions and the needs of all stakeholders. They utilise advanced neural network architectures that can process intricate, multidimensional data, including patent quality metrics, market penetration rates, competitive analyses, and regional economic indicators, to generate licensing recommendations that aim to benefit all parties involved, rather than favouring those who have traditionally held more power.²³ Machine learning frameworks for royalty optimization utilise ensemble methods, which combine multiple algorithmic approaches to ensure dependable and consistent recommendations across various licensing scenarios. Supervised learning algorithms are employed to analyse historical licensing agreements and their outcomes, identifying patterns that correlate with successful long-term arrangements. Simultaneously, unsupervised learning methods are used to uncover hidden relationships between various factors that influence licensing success. Furthermore, reinforcement learning components enable the system to continuously refine its recommendations based on feedback from actual licensing implementations and their subsequent market performance.

India's comprehensive patent licensing dataset, which includes agreements from the telecommunications, pharmaceuticals, information technology, and manufacturing sectors, offers valuable training data for machine learning frameworks designed to optimize royalty structures. The diversity of India's technology ecosystem, encompassing large multinational corporations and small indigenous start-ups, creates licensing scenarios that span the full range of market conditions and stakeholder characteristics.²⁴ This diversity renders Indian licensing data particularly valuable for training algorithms that must perform effectively across diverse economic and technological contexts.

Prototype testing in controlled environments enables systematic evaluation of machine learning frameworks under realistic conditions while minimizing risks associated with deploying untested systems in high-stakes licensing negotiations. Simulation environments can model complex licensing scenarios involving multiple parties, competing technologies, and dynamic market conditions to assess

²³ Martin J. Adelman et al., *Patents and Technological Progress in a Globalized World* 300–05 (Springer 2009).

²⁴ Institute of Electrical and Electronics Engineers, IEEE-SA Standards Board Bylaws on Patents in Standards, IEEE, <https://standards.ieee.org/about/policies/bylaws/sect6-7.html> (last visited July 29, 2025).



how well machine learning recommendations perform compared to traditional negotiation outcomes. These testing environments can also evaluate system robustness under adversarial conditions where parties might attempt to manipulate inputs to achieve favourable but unfair outcomes. Neural network architectures specifically designed for patent licensing applications must consider the complex, non-linear relationships between technological contributions, market dynamics, and fair compensation. Deep learning models can process patent documentation, technical specifications, and market analysis reports to extract relevant features that might be overlooked by traditional linear models. Convolutional neural networks can analyse patent diagrams and technical drawings to assess technological complexity, while recurrent neural networks can model temporal relationships in licensing agreements and their evolution over time.

The behavioural simulation components within machine learning frameworks consider the psychological and strategic elements that shape licensing negotiations, extending beyond technical and economic factors. Game theory models can forecast how different parties might react to various licensing proposals, while behavioural economics algorithms can accommodate cognitive biases and cultural differences that influence negotiation dynamics. These behavioural models are especially valuable in cross-border licensing scenarios where parties may have notably diverse cultural backgrounds and business practices. Integration capabilities ensure that machine learning frameworks can effectively interact with existing patent databases, legal document systems, and market intelligence platforms to access the comprehensive data needed for optimal royalty structure generation. Application programming interfaces (APIs) facilitate real-time data integration from multiple sources, while natural language processing capabilities enable the system to extract pertinent information from unstructured documents such as patent applications, licensing agreements, and court decisions. This integration capability is crucial for maintaining current and comprehensive datasets that reflect changing market conditions.

Customization features allow machine learning frameworks to tailor their recommendations to various implementers, especially those from emerging economies who may have differing financial resources and market standings compared to established multinational corporations. Adaptive algorithms can modify royalty calculations based on implementer attributes like company size, market presence, technological capabilities, and regional economic conditions. This customization is essential to ensure that licensing systems foster genuine accessibility rather than exacerbating existing disparities among



different market participants. Indian government initiatives, such as the Start-up India program and various technology incubation schemes, offer practical examples for evaluating how machine learning frameworks can facilitate licensing agreements that encourage innovation while ensuring fair compensation for patent holders. These programs frequently involve intricate relationships between government funding, private sector collaborations, and intellectual property rights, leading to complex licensing situations. Machine learning systems capable of navigating these complexities while supporting innovation goals could significantly improve the efficacy of such programs.

The integration of quantum computing presents a novel opportunity for machine learning frameworks, particularly in addressing the growing complexity of patent licensing within advanced technology sectors. Quantum machine learning algorithms may offer the potential to process significantly larger datasets and model intricate relationships more effectively than traditional computing methods, thus facilitating more refined and precise royalty optimization. As quantum computing technologies advance, patent licensing systems that can harness these capabilities could gain a considerable advantage in managing complex, multi-party licensing situations. It is essential that validation methodologies for machine learning frameworks guarantee that algorithmic recommendations are consistent with legal requirements, ethical principles, and practical business needs across various jurisdictions. Cross-validation methods utilizing historical licensing data can evaluate prediction accuracy, while legal compliance checks can verify that generated recommendations adhere to pertinent patent laws and competition regulations. These validation procedures are especially critical for systems operating across multiple legal jurisdictions, which may have conflicting requirements and standards.

Scalability considerations are crucial to ensure that machine learning frameworks can manage the increasing volume and complexity of patent licensing scenarios as global technology ecosystems continue to expand and become interconnected. Cloud computing architectures facilitate the distributed processing of large datasets and the parallel execution of complex algorithms across multiple computing nodes. Edge computing capabilities can bring machine learning processing closer to data sources, thereby reducing latency and enhancing responsiveness for real-time licensing applications. Performance optimization techniques are necessary to ensure that machine learning frameworks can provide timely recommendations, even when processing extensive patent portfolios or complex multi-party licensing scenarios. Advanced caching mechanisms store frequently accessed



patent data and pre-computed analysis results, while incremental learning algorithms can update recommendations based on new information without requiring complete reprocessing of existing datasets. These optimizations are vital for systems operating in real-time business environments where delays in licensing decisions can have significant commercial consequences.

CONCLUSION

The exploration of autonomous patent licensing systems presents a remarkable opportunity to address the enduring inequities and inefficiencies that have affected traditional intellectual property frameworks for many years. Autonomous computational systems, driven by artificial intelligence algorithms and decentralised validation networks, offer exceptional prospects for establishing truly equitable licensing environments that prioritize innovation accessibility rather than market dominance. These systems have the potential to fundamentally transform global technology governance by replacing subjective, power-based negotiations with objective, data-driven processes that consider genuine technological contributions while accommodating diverse economic realities across various regions and market segments.

The thorough analysis of post-pandemic licensing conflicts reveals that traditional mechanisms are not sufficiently equipped to manage the rapid changes and complex interdependencies that define modern technology ecosystems. The 25 documented conflicts examined in this research consistently reveal patterns of exploitation, delay, and discrimination that autonomous systems could potentially eliminate through algorithmic objectivity and real-time adaptation capabilities. These findings suggest that the transition toward autonomous licensing is not merely a technological advancement but an essential evolution to ensure that patent systems fulfill their intended function of promoting innovation rather than impeding it.

India's experiences across multiple technology sectors provide compelling evidence for the urgent need to implement more equitable licensing frameworks that can accommodate the unique challenges faced by emerging economies. The country's struggles with excessive royalty demands in telecommunications, delays in healthcare technology access, and barriers to participation in global standard-setting processes illustrate how traditional licensing mechanisms can perpetuate technological dependence rather than fostering genuine innovation partnerships. Autonomous systems offer the potential to create a more level playing field by ensuring that licensing decisions are based on objective technological merit rather than negotiating power or market position.



Policy recommendations emerging from this research emphasize the importance of coordinated international efforts to develop and implement autonomous licensing frameworks. Governments should establish regulatory sandboxes that enable controlled testing of dynamic licensing systems while protecting stakeholder interests during transition periods. India's experience with regulatory innovation in sectors like digital payments and telecommunications demonstrates the value of such phased implementation approaches. It would be beneficial for international standard-setting bodies to work together in establishing shared protocols for autonomous licensing systems. These systems should be designed to function smoothly across various legal and cultural contexts, while also adhering to local regulations and cultural sensitivities.

In order to encourage the adoption of autonomous licensing, incentive structures should be carefully designed to consider the inherent hesitations of established market participants who may benefit from the current power dynamics. Offering subsidies and tax incentives to companies involved in pilot autonomous licensing programs could potentially expedite adoption while also generating valuable real-world testing data.²⁵ The success of India's Digital India program in promoting digital transformation illustrates how strategic government support can effectively accelerate technology adoption across various economic sectors. Similar strategies could be implemented to encourage the adoption of more equitable patent licensing systems. In addition, research and development endeavours should focus on resolving the remaining technical difficulties while guaranteeing that autonomous licensing systems can competently manage the intricacies of actual patent ecosystems. Further progress in artificial intelligence, blockchain technologies, and distributed computing will undoubtedly improve the capabilities and dependability of these systems. India's growing prowess in artificial intelligence research and development, supported by initiatives like the National AI Portal and various technology incubation programs, enables the country to take a leading role in the development of next-generation licensing technologies.

International cooperation mechanisms must be established to ensure that autonomous licensing systems can function effectively across different legal jurisdictions and cultural contexts. Bilateral and multilateral agreements between countries could establish common frameworks for recognizing and enforcing autonomous licensing decisions while respecting national sovereignty over intellectual

²⁵ U.S. Patent and Trademark Office, Standard Essential Patents and FRAND Licensing, USPTO, <https://www.uspto.gov/ip-policy/patent-policy/standard-essential-patents> (last visited July 29, 2025).



property policies. India's active participation in international forums like the World Intellectual Property Organization and various regional technology partnerships provides a foundation for promoting such cooperative approaches to patent licensing reform. Stakeholder engagement strategies should ensure that all affected parties have meaningful input into the design and implementation of autonomous licensing systems. Patent holders, implementers, government agencies, and civil society organizations all have legitimate interests that must be considered and balanced. India's experience with multi-stakeholder consultation processes in developing digital governance frameworks demonstrates the importance of an inclusive approach to technology policy development. Similar consultative processes could help build consensus around autonomous licensing system designs that serve all stakeholders effectively.

It will be crucial to implement educational and capacity-building programs to equip legal professionals, business leaders, and policymakers with the necessary skills to effectively engage with autonomous licensing systems. Traditional legal education and business training programs may require considerable revisions to address the technical and conceptual complexities introduced by algorithmic decision-making in patent licensing. India's existing strengths in technical education and its expanding expertise in artificial intelligence and machine learning offer a strong basis for the development of these educational programs. Furthermore, it is essential to establish monitoring and evaluation frameworks to assess the performance of autonomous licensing systems and pinpoint areas for enhancement as they are implemented in practical settings. Key performance indicators should encompass metrics related to licensing efficiency, equity outcomes, innovation incentives, and stakeholder satisfaction. Regular assessments of system performance can facilitate iterative improvements and aid in the early identification of potential issues before they escalate. It is important for risk mitigation strategies to consider the potential negative consequences associated with failures or manipulation attempts within autonomous licensing systems. Safeguards, such as backup systems and human oversight, can help to mitigate algorithmic errors or attempts to manipulate these systems. Cyber security measures are also essential to protect autonomous licensing systems from attacks that could compromise their integrity or availability. India's experience in securing large-scale digital systems, such as Aadhaar, offers valuable insights for protecting autonomous licensing infrastructure.²⁶ Furthermore, future research should investigate opportunities for integrating autonomous patent licensing systems with emerging

²⁶ C. Bradford Biddle et al., *Patent Remedies and Complex Products: Toward a Global Consensus* 200–05 (Cambridge Univ. Press 2019).



technologies like quantum computing, advanced artificial intelligence, and distributed ledger technologies. These technological advancements could potentially enhance the capabilities and reliability of autonomous licensing systems while addressing their current limitations. Research into the social and economic impacts of autonomous licensing could also inform policy decisions and contribute to optimizing system designs for maximum societal benefit. The vision of inclusive global technology governance, facilitated by autonomous licensing systems, signifies more than just a technical solution to current patent licensing issues. It reflects a core dedication to ensuring that technological advancements benefit all of humanity, rather than being confined to a select group. For nations like India, which possess substantial technological capabilities but have been disadvantaged by current patent licensing frameworks, autonomous systems offer the prospect of true technological independence and fair involvement in global innovation ecosystems.



CHAPTER 02

UNIFYING INNOVATION AND MARKET FAIRNESS: COMPETITION LAW INTERVENTIONS AGAINST SEP ABUSE IN INDIA'S TECHNOLOGY SECTOR

- Rathul Dev S*

Abstract

The rapid growth of India's technology intensely depends on Standard Essential Patents (SEP), but in some cases SEP holders misuse their dominant position in the market, which leads to anti-competitive practices such as patent hold-up by demanding unfair conditions. This may compromise healthy competition in the market and limits innovation. Indian competition law ensures that companies holding Standard Essential Patents (SEP) license them on fair, reasonable and non-discriminatory (FRAND) terms. The paper mainly discussed how Indian competition law addresses the abuse of dominant position by SEP holders to maintain a healthy technological ecosystem. Also, through the doctrinal study, the paper explores the application of law in the key cases involving companies such as Ericsson, Nokia, Oppo, aiming to ensure that technology remains accessible and fairly distributed in the market. The paper evaluating the competition authority's duties and responsibilities look into India's competition law framework to regulate SEP licensing to foster innovation and sustain a competitive market environment. This paper compares how Indian competition law and the laws of other key countries handle SEPs, highlighting both the similarities and the differences. It provides policy recommendations designed to strengthen enforcement approach for more harmonious balancing of market access goals with innovation incentives. The results inform regulators, industry stakeholders, and policymakers who are keen to navigate the intricate SEP world while advancing India's technological progress.

KEYWORDS: SEP, Competition law, FRAND, Technology Sector, CCI

INTRODUCTION

Today's global market is primarily influenced by the fast pace of technological progress and the resulting innovation. As a result, the main reason for the emergence of patent law is to give protection to technology-based inventions through the granting of exclusive rights for a certain time. The principle of giving a patent not only assures the safeguarding of the technology but it also rewards, in

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the form of monopoly rights, the effort, the capital outlay and the research work done by the inventor for a specific period of time. One significant development in this respect is the rise of Standard Essential Patents (SEPs). SEPs refer to patents that cover technologies which are necessary for the adherence to industry standards and as such all users of that field must use them. Though SEPs by facilitating interoperability, easing co-operation and often leading to higher consumer welfare, are also seen to trigger important concerns from the view point of competition law. Until now, most people believed that owning patents is linked to having more control in the market.²⁷ This idea was first supported by a court case called *United States v. Loews*,²⁸ where the court said that if a product is tied to another and is patented or copyrighted, the owner has market power. However, this view was later changed after more detailed economic research showed that this approach didn't take into account the full economic picture and ignored possible benefits. Studies show that patents are not evenly valuable. Most patents don't have much value, while only a small number have significant market worth.²⁹ Patents can lead to more control in the market because when standards are set, the value of the technology goes up. This process often removes similar technologies and reduces competition. Especially in areas where compatibility is important, setting a standard can push out competing technologies from the market. According to the Indian Competition Act, 2002, an entity can be seen as harming competition only if it has market power. Just having a patent isn't enough to show market power; it needs to be carefully assessed. When looking at possible violations of competition laws, two key things must be checked: First, it's checked whether the company has a strong position in the market. This means seeing if it can act without being influenced by customers or other companies. Second, it's checked whether that strong position is being used in a way that harms competition. Both steps are important in deciding if competition laws have been broken. Therefore, market power plays a key role in how dominance and its misuse are reviewed legally.

The legal system in India that deals with Standard Essential Patents (SEPs) is mainly based on two important laws. These are: the Patents Act, 1970, which is the basic law for patent protection in India, which is still in force; and the Competition Act, 2002 which is enacted to combat unfair competition and abuse of power in the market. As per this laws, SEP owners are required to license their patents

²⁷ Tulika Shree, *The Role of Competition Law to Determine Abuse of Dominance in Context of Standard Essential Patents: A Comparative Study*, 7 RGNUL FIN. & MERC. L.J. 125 (2020).

²⁸ 371 U.S. 38 (1962).

²⁹ Alexander Wurzer, *The 360° IP Strategy: Securing Long-Term Innovation Success - dIPlex*, dIPlex (2025), (last visited Aug 5, 2025).



on fair, reasonable and non-discriminatory (FRAND) terms. However, there is a lack of clarity on how these obligations are to be fulfilled and concerns and many controversies arise over how to regulate market conduct. The Competition Commission of India (CCI), being the highest body of competition regulators, needs to intervene and render the anti-competitive practices of the owners of SEPs null and void in such instances where such practices act to a competition or consumer welfare.³⁰ The aspects of SEPs and competition laws thus must be understood to enable the efficient working of the body of SEPs and aid market competition and innovation. While SEPs have been instrumental in technological progress and standardization in the telecom sector, the threat of criminality and watchdogism in controlling them remains. It remains to be seen how this relationship progresses in the context of technological and legal changes in the Indian telecom industry.

Competition law plays a crucial role in addressing unfair terms related to intellectual property licensing. While the former requires healthy competition, there is concern that the latter may act in a way that hinders such competition.³¹ The environment of innovation calls for greater interaction between intellectual property and competition law principles. In the context of such interactions, the courts have the responsibility to resolve conflicts that may arise this has been observed in Standard Essential Patent (SEP) litigations in the telecommunications sector. What makes this high-tech industry unique is the high expenditure involved in research and development (R&D) and the first mover advantage that comes with it. This helps many companies to achieve dominant position in the market through their cell phone chip patents (SEP).

STANDARD ESSENTIAL PATENTS AND FRAND TERMS

In the special environmental enforcement of particular habitats, the concept of SEPs is a cornerstone that defines the land of renovation and interventional abilities. These patents represent critical invocations that the industrial players think that the industry players are inevitable to meet the established industrial industry. Facilitate disruption to a variety of technologies.³²

SEP is a type of patent protecting the core technology of the role technology. The core technology of an industry is the criterion for using the entire industry to continue the industry. Therefore, a Sep

³⁰ CAM Competition Team, Standard Essential Patents – The Irony of Standardization, COMPETITION LAW (2018), (last visited Aug 5, 2025).

³¹ Amrit Subhadarsi, Telecommunication and Competition Law in India and EU: A Comparative Excursus, 14 Shriji Socio Legal J. 9,(2018).

³² J.Y. Xiang, Intellectual Property, Antitrust, and Access to Essential Technologies, 26 Lewis & Clark L. Rev. 1101 (2022).



claims that an industry is an essential technology.³³ SEPs are significant technological advances that demand respect as an obligatory instrument for industry standards. These patents protect technological innovations essential to enabling products and services to comply with the requirements of existing industry standards.³⁴ Their importance lies in providing standard interfaces, protocols, or functions so that different devices or systems within an ecosystem can easily communicate. For instance, SEPs could refer to technology essential to 4G or 5G connectivity standards within telecommunications. And, in consumer electronics, they might cover inventions that are fundamental for meeting standards such as HDMI or USB. However, the importance of the SEPs lies beyond their causes of force in technicality.

Most industries operate toward the widest acceptance of any standard technology. Thus, having established the general base and uniformity, SEPs produce attraction to create upgrade and market access.³⁵ Therefore, efficient standardization ensures the development and deployment of products and services while assuring compatibility among diverse mutually offered solutions to rich customer experiences. These industries have heavily relied on spectrum access for upgrades and are raising the spectrum of service-providers, and products available for respective development and application³⁶. Trust in standard solutions heightens the pace of technical innovation, integration, and expansion of all novel offers into diverse market segments.

LEGAL FRAMEWORK RELATED TO SEP'S IN INDIA

The Patent Act, 1970

The Patent Act of 1970 is the primary legislation governing India's rights. The Act promotes innovations and technological advancement by granting exclusive rights over their innovations for a particular period. Under this law, SEPs provide similar protection to other patents, but special obligations are associated with licensing. Patent owners have to disclose their patents to the relevant Standard setting organisations (SSOs) to ensure openness and accountability.

³³ Standard Essential Patents, PATENTS (2023), <https://www.wipo.int/en/web/patents/topics/sep> (last visited Aug 7, 2025).

³⁴ S. Leih & D.J. Teece, Antitrust, Standard Essential Patents, and the Fallacy of the Anticommons Tragedy: Legal and Industrial Policy Concerns, 32 Berkeley Tech. L.J. 1301 (2017).

³⁵ M. Singh, Disclosure Under SSO IPR Policies: A Theoretical Perspective, 12 NTUT J. Intell. Prop. L. & Mgmt. 63 (2022).

³⁶ Knut Blind, The Impact of Standardisation and Standards on Innovation, in *Handbook of Innovation Policy Impact* 423 (Jakob Edler et al. eds., 2016).



The Competition Act, 2002

The Competition Act 2002 promotes a healthy market competition and prohibits any conduct that may impede competition inside India. It offers a framework for regulating the misuse of a dominant position, which occurs when a monopolistic entity with market power performs actions that harm competition and consumers. The Act defines what power is and gives an indicative list of different forms of misuses, such as overcharging or using unfair tactics. Where Standard Essential Patents (SEPs) are concerned, competition law has a significant impact as they oblige the licensors of the patent holders to provide licenses that are fair, reasonable, and non-discriminatory (FRAND). Basically, the power holder of SEP should not exploit the monopoly by charging unreasonable license fees or stopping other rivals from entering the market.

STANDARD SETTING ORGANISATIONS (SSO)

Standard-setting organizations are frequently caught in difficult situations when a company or several companies assert that they have sole rights to a new industry standard. The industry cannot really adopt that standard unless the company holding the rights gives the green light. How these organizations navigate these claims is crucial. If companies retain their rights to the standard, it could end up being closed off to others. This decision will influence who gets to produce products that align with the standard and could also determine which standard gains traction in the market, whether it's one established by a collective or one dictated by a single entity. Additionally, the rules these organizations set regarding intellectual property will play a significant role in how the standard evolves as technology advances.³⁷ With following to FRAND commitments, patent holders ensure their technologies are accessible to anyone who wants to use them. This fosters a fair playing field where competitors can tap into standard technologies without facing unfair hurdles (Contreras, 2019).³⁸ The collaboration among SSOs, combined with transparency and FRAND commitments, nurtures a culture of inclusivity, healthy competition, and innovation in standardization. These organizations play a crucial role in keeping essential technologies available, which in turn drives technological advancement and progress across various industries, while also minimizing the risk of any single company monopolizing standard products and services.

³⁷ Chrysoula Pentheroudakis & Justus Baron, Licensing Terms of Standard Essential Patents: A Comprehensive Analysis of Cases, JRC Sci. for Pol'y Rep. (2017).

³⁸ Jorge L. Contreras, Fixing FRAND: A Pseudo-Pool Approach to Standards-Based Patent Licensing, 79 Antitrust L.J. 47 (2013).



FRAND OBLIGATIONS

The idea of “Fair, Reasonable, and Non-Discriminatory” (FRAND) terms is not clearly defined in law, but Standard Setting Organizations (SSOs) give some limited guidance for determining standards. The purpose is to create fair licensing rules, keep fees reasonable, encourage innovation, and at the same time reward SEP holders for their inventions.

ABUSE OF DOMINANCE BY SEP HOLDERS

Section 4 of the Competition Act of 2002 defines the term "abuse of dominance" in India.³⁹ A company is said to be a dominant one if it has sufficient economic power to operate solely without the impact of regular market competition, or if it is able to persuade competitors or customers to do what it desires.. The law can define abuse as a number of actions, such as discriminatory practices, excessive pricing, and refusal to deal. A dominant firm engages in excessive pricing when its prices are much higher than those of its competitors. Refusing to provide essential facilities or goods that competitors need to carry on their business is known as refusal to deal, whereas discriminatory practices include giving different prices or terms to different clients without cause. To determine whether a company is abusing its dominant position, the legal framework examines market share, price-influencing power, and the overall market structure in detail.⁴⁰ Abuse of SEPs can stifle competition, reduce consumer choice, and lower product quality, preventing smaller firms from entering the market and resulting in entrenched domination by larger companies, reduced innovation, and weaker technological progress. Therefore, it is necessary to address abuse of dominance so that we have a fair, competitive, and innovative market.

TYPES OF ABUSE

Patent Hold-Up

Patent hold-up occurs when companies that possess essential standard-essential patents (SEPs) leverage their significance in an industry standard to gain an advantage. Once a standard becomes widely adopted, these companies might demand much higher royalty fees or push for unfavourable licensing agreements. Controlling of patent rights after a standard is established, these companies can manipulate market dynamics and hinder the progress of new products and services.

³⁹ Competition Act, 2002, No. 12 of 2003, Section 4.

⁴⁰ S. Vishnu, Software Interoperability and Competition Law, 25 J. Intell. Prop. Rts. 180 (2020).



Fair, Reasonable, And Non-Discriminatory (Frاند) Licensing Policy

In India, courts have not really nailed down a clear stance on FRAND, but they have tackled similar issues in cases where someone has used a SEP without permission. The questions about how to calculate royalties, the implications of Non-Disclosure Agreements (NDAs), and the distinction between willing and unwilling licensees are raised in *Ericsson v. Intex*, 2023.⁴¹ In FRAND terms, both SEP holders and those looking to use the patents have responsibilities. Holders need to provide fair conditions, while users should actively seek a license instead of waiting for better terms. Courts emphasize the importance of open and honest discussions; if someone drags their feet, they might miss out on injunctive relief.⁴² There's also an ongoing debate about whether SEP holders should offer licenses for each patent individually or if they can bundle several patents together. The Delhi High Court has ruled that providing a global portfolio license is acceptable under FRAND, as the technology is often interconnected on a global scale.⁴³

Royalty Stacking

Another issue of interest is calculating royalty in case of SEP licensing. Most of the time, in the name of convenience, SEP holders will compute royalties on the basis of the price of the final product as a whole. This is worrying since firms can be paying royalties on aspects of the end product which have no bearing on the SEP and which also can lead to stacking of royalties. The CCI has also raised its apprehensions with this situation, yet as the courts have not curtailed SEP holders in this aspect. This is one technique over which Indian courts have frequently been willing to exercise, because courts in other countries have permitted analogous methods of calculating royalty in other situations. Basically, SEP holders request NDAs before entering negotiations, which can restrict the flow of information and may allow them to charge varying rates. Courts have generally accepted NDAs since they help safeguard intellectual property, even though some express concerns about their restrictive nature.

ROLE OF COMPETITION AUTHORITIES

With the rise of SEPs, competition authorities around the world have taken greater interest in monitoring SEPs for consumer welfare and market competitiveness: The European Commission, the

⁴¹ *Intex Techs. (India) Ltd. v. Telefonaktiebolaget LM Ericsson*, FAO(OS) (COMM) 296/2018.

⁴² Yann Ménière, *Fair, Reasonable and Non-Discriminatory (FRAND) Licensing Terms: Research Analysis of a Controversial Concept*, in *European Commission Joint Research Centre* (2023).

⁴³ David Long, *Essential Patent LLC*, ESSENTIAL PATENT BLOG (2023), <https://www.essentialpatentblog.com/2023/04/indias-high-court-of-delhi-issues-guidance-on-sep-licensing-that-seeks-to-harmonize-decisions-in-other-countries-intex-v-ericsson>.



US Federal Trade Commission (FTC), and various national antitrust regulators around the globe have ramped up investigations and involvement in SEP-related matters through a range of tools including inquiries, enforcement actions, and evaluations of SEP holders compliance with FRAND commitments to ensure that essential technologies remain available on fair terms to all market participants.⁴⁴ They also have the role of assessing whether the SEP holders are fulfilling their FRAND commitment so that the required technology is affordable to all within the market.

The CCI is charged with the role of anti-competition review and competition policy promotion; it conducts awareness campaigns among stakeholders about the advantages of competition, and strives to instil the culture of compliance in corporate India. SEP giving specific challenges to competitive markets, the CCI has been proactive towards regulating these patents by carefully examining licensing procedures and making sure that Fair, Reasonable and Non-Discriminatory (FRAND) terms are followed.⁴⁵

Licensing negotiations are also subject to investigation by competition authorities who check whether SEP holders adhere to their FRAND commitments and behave in good faith; otherwise, they can use sanctions or corrective actions, which prevent market distortions caused by patent ambushes and hold-ups and the lack of access to essential innovation that might be hampering fair competition.⁴⁶

Challenges Faced By CCI

Even though the Competition Commission of India (CCI) has set up a clear system for handling Standard Essential Patents (SEPs), it still faces problems when trying to regulate them. One big reason is that its role often overlaps with other regulators, like the Telecom Regulatory Authority of India (TRAI), making it hard to know who is in charge of certain SEP-related issues. This confusion can slow down or complicate enforcement.⁴⁷ Major challenge for the CCI is finding the right balance between protecting the rights of patent owners and making sure that powerful companies don't use

⁴⁴ Zografos, A. S., SEP Holder's Guide to the Antitrust Galaxy: FRAND and Injunctions, 37 World Competition 53 (2014).

⁴⁵ Kiran S., Competition Commission of India: Duties and Powers, Aliah U. J.L. & Governance (2020).

⁴⁶ Arvonen, E., To FRAND, or Not to FRAND, That Is the Question: Analyzing FRAND Terms and Proposed Alternatives (2021).

⁴⁷ Ansruta Debnath, A Case for CCI's Jurisdiction Over Standard Essential Patents, IRCCL (2024), <https://www.irccl.in/post/a-case-for-cci-s-jurisdiction-over-standard-essential-patents>.



their patents to unfairly block competition. It's important to support innovation, but also to make sure the market stays open and fair.⁴⁸

CASE STUDIES

*Ericsson v Intex*⁴⁹

The case between Ericsson (plaintiff) versus Intex (defendant), which was heard by the Delhi High Court, was upheld on many key issues raised in the lower court: The validity of Standard Essential Patents (SEPs), that they are essential to industry standards and infringed; FRAND compliance of licensing terms, unwilling licensee behaviour, and portfolio licensing strategy. Intex also claimed that the SEPs were not valid and opposed payment of interim royalties on grounds that there was no evidence of essentiality or infringement.

*Nokia V Oppo*⁵⁰

Background Facts Claimants belong to the Nokia group, headquartered in Finland, and having a massive global patent portfolio that forms the basis of numerous wireless telecommunications standards established by European Telecommunications Standards Institute (ETSI), including standard-essential patents (SEPs), which ETSI would require owners to make available to users under fair, reasonable, and non-discriminatory (FRAND) terms and conditions. The defendants belong to the Chinese firm Oppo a multinational manufacturer and distributor of devices that are compliant with ETSI. Nokia and Oppo entered a three-year cross-license agreement on June 30, 2021, which expired on June 30, 2021. When they could not agree on a new license, Nokia filed suit in the High Court (UK proceedings) for injunctive relief in the UK on July 1, 2021.

COMPARATIVE STUDY WITH UK AND USA

United Kingdom

Some patents in the United Kingdom have been described as standard essential patents (SEPs). These patents are required in the process of implementing technical standards that are made by standard-setting organisations (SSOs).⁵¹ SEPs are considered a key in consumer electronics,

⁴⁸ Dayitha T.K., Standard Essential Patents and Abuse of Dominance: Implications for India's Telecom Sector, 6 *Int'l J. for Multidisciplinary Res.* 6 (2024).

⁴⁹ 2023:DHC:2243-DB.

⁵⁰ [2023] EWHC 1912(Pat).

⁵¹ Enforcement of Standard Essential Patents - current bottlenecks and possible solutions, INTERNAL MARKET, INDUSTRY, ENTREPRENEURSHIP AND SMES (2021), <https://single-market->



telecommunications, and the automotive industry because they make products and systems compatible. According to UK law, the owners of SEPs must issue licences to everyone who asks them, on terms which are fair, reasonable and non-discriminatory (FRAND).⁵² The significance of these FRAND requirements is that they help to ensure that SEP holders do not abuse their market power and become anti-competitive.⁵³ Competition law Competition and Markets Authority (CMA) has published advice on the application of competition law to SEPs, which emphasises the importance of fair licensing conduct. Additionally, the UK government is advocating on the international front to adopt alternative dispute resolution (ADR) in the form of arbitration and mediation⁵⁴ since these are effective tactics in resolving disputes in the SEP licensing. Another way in which the United Kingdom is trying to make the settlement of SEP licensing disputes more effective and less expensive is through the promotion of alternative dispute resolution (ADR) measures. Its general philosophy is to encourage innovation and competition within the market, and at the same time to make sure that SEP holders are fairly compensated in their market research and development work. The UK aims to find a balance between patent protection and competition protection by endorsing ADR, demanding a certain set of FRAND licensing requirements, and offering clear guidelines on licensing SEP.

The United Kingdom has a mature intellectual property rights protection regime, and the core of it is the Patents Act of 1977. European law has also informed the framework of the legal provisions of standard essential patents and it has heavily impacted the UK legal system. The standard essential patents are subject to both patent law and competition law in the UK. The Competition and Markets Authority has provided guidance on the basis of licensing once founded on FRAND principles, where the patent holder must offer licences on fair, reasonable and no discrimination conditions. This framework has also been developed by the UK courts. A notable judgement was the recent Supreme Court ruling where *Unwired Planet International Ltd v Huawei Technologies (UK) Co Ltd* (2017) in which the Court had ruled that licences to be granted on global FRAND basis in standard essential patents instead of country-based markets.

United States of America

economy.ec.europa.eu/events/enforcement-standard-essential-patents-current-bottlenecks-and-possible-solutions-2021-05-19_en.

⁵² Intellectual Property Office, Standard Essential Patents (SEPs) explained, GOV.UK (2023).

⁵³ *Unwired Planet Int'l Ltd. v. Huawei Techs. Co.*, [2017] EWHC (Pat) 711 (Eng.).

⁵⁴ The Department of Justice, U.S. Patent and Trademark Office and National Institute of Standards and Technology withdraw 2019 Standards-Essential Patents (SEP) policy statement, USPTO.GOV (2022).



The history of standard essential patents in United States is long and complicated, since it started with the early evolution of telecommunications industry.⁵⁵ SEPs have been the focus of more litigation and policy discussion over the last few decades. In 2013, the first major twist took place with the joint release of a policy statement on SEPs by the Department of Justice and the U.S. Patent and Trademark Office⁵⁶. This declaration made governmental stance on major matters, such as the relevance of terms of FRAND licensing as well as the antitrust issues which may arise due to the implementation of SEP. Several high-profile SEP cases have since emerged in the United States, such as the ongoing dispute between Apple and Qualcomm over Qualcomm's licensing practices that has raised several complex legal and policy questions about SEP licensing, such as how to determine FRAND royalties and when SEP.

The US legal system of standard essential patents is built upon the patent law and the antitrust law. Patent law aims at promoting innovation by granting inventors the rights to prevent others to use their inventions during a temporary period. Antitrust law, however, is aimed at preventing anti-competitive behaviour. The interplay of the two fields of law is particularly vital when it comes to patenting something which is essential to a standard. The most important antitrust laws are the following: Section 1 and 2 of the Sherman Act outlawing any agreement that unreasonable restrains commerce and any attempt to monopolise a market and Section 5 of the Federal Trade Act Commission which outlaw any unfair practise of competition. Related patent legislation is the Patent act, and the case law, which interprets this law, according to which the inventor is given a temporary monopoly on their invention.

CONCLUSION

The relationship between innovation, market fairness, and competition law in the field of standard essential patents (SEPs) has emerged as a developing and increasingly important area of legal study and practice. This paper has shown that SEPs, although essential to facilitating interoperability, industry standardization, and accelerating technological development, can also be fertile ground for anticompetitive behaviour if holders of those patents misuse their market power. While the Indian experience is still at an early stage compared with more mature jurisdictions such as UK, EU, and

⁵⁵ Carl Shapiro, *Antitrust Limits to Patent Settlements*, 78 *Antitrust L.J.* 67 (2012).

⁵⁶ The Department of Justice, U.S. Patent and Trademark Office and National Institute of Standards and Technology withdraw 2019 Standards-Essential Patents (SEP) policy statement, USPTO.GOV (2022).



USA, it provides a laboratory to study how a developing economy facing rapid digital transformation deals with the twin goals of promoting innovation while maintaining fair competition. The underlying issue is the FRAND (Fair, Reasonable, and Non-Discriminatory) licensing obligation, which in theory attempts to strike a balance between two competing goals: rewarding innovators for their R&D investments and ensuring that essential technologies remain available to all market participants. However, given the lack of statutory guidance in India, this has led to legal ambiguities, inconsistent interpretations, and protracted disputes (e.g., *Ericsson v. Intex* and *Nokia v. Oppo*) that demonstrate a critical need for a structured, transparent, and predictable FRAND enforcement framework that minimizes the exercise of discretion and ensures consistent outcomes.

The doctrinal analysis in this paper shows that abuse of dominance in the SEP context frequently manifests. While the CCI has done commendable work to address such anti-competitive conduct by regulating licensing practices and upholding FRAND principles, it is now time for the CCI to issue detailed SEP guidelines as was issued by UK's Competition and Markets Authority (CMA) which could be an authority on SEP-related competition issues that courts, implementers, and SEP holders can rely upon. The comparison with both the UK and USA offers some interesting insights into what India must do in terms of policy evolution; the UK has embraced ADR for SEP disputes and its courts have recognized global FRAND licences (*Unwired Planet v. Huawei*). As the competition regulator, the Competition Commission of India (CCI) is still challenged to control anti-competitive behaviour involving standard essential patents (SEPs). Its operation is limited by the overlapping of jurisdiction with sectoral regulators like the Telecom Regulatory Authority of India (TRAI) as well as its lack of expertise in technical roles as well as the lack of a specific legislative provision that would specifically take into consideration the element of competition that is related to SEP. Despite the steps made by CCI to examine licensing behaviour as well as create the stringent implementation of FRAND principles, the already understood solution to the need is that formulation of comprehensive SEP guidelines, which in turn may be applied as reference points by both courts and implementers and even the SEP holders in the first place. India can learn a lot by looking at the UK experience and the United States: not only has the UK developed alternative dispute resolution (ADR) methods to address the problem of SEP disputes and ensured that its courts have been informed of global FRAND licences, but the United States has additional lessons to offer in balancing the incentives to innovate and the need to promote competition.



India's major policy can be interpreted as the following ones. To begin with, codification of FRAND obligations in legislation regarding considerations to be used to calculate royalties, extent of licensing and protection of the process- would create better legal certainty and predictability. Second, the CCI needs to be strengthened institutionally, e.g., by the creation of specialised technical sections or partnership with academic institutions and research facilities, which would allow it to address the more technical aspects of SEP contests more productively. Third, the marketing of the use of alternative dispute resolution (ADR) mechanisms would help to alleviate litigation backlogs and decrease the costs of transactions as well as developing cooperative back and forth negotiations in licensing. Fourth, there should be creation of statutory or memorandum constructions regarding the coordination between the CCI and the regulators of sectors to avoid overlaps in jurisdiction and regulatory gaps. Last but not least, reform initiative should consider the international nature of SEP ecosystems. SEPs are essential building blocks to innovation and global interoperability in fields like telecommunications, consumer electronics, and other new technologies such as machine learning, data analytics, artificial intelligence and more.

In the future, it will be crucial to foresee and proactively handle any potential issues related to SEPs. To create strong, flexible frameworks that support innovation and technological advancements while preserving fair competition, policymakers, standard-setting bodies, and competition authorities must work together. Navigating future challenges will require establishing more transparent licensing negotiations, establishing clearer guidelines for determining FRAND terms, and putting in place effective dispute resolution procedures. Fair competition and innovation can be further facilitated by supporting cooperative efforts to create industry standards and encouraging voluntary adherence to moral licensing practices. Additionally, encouraging communication between stakeholders such as implementers, SEP holders, and consumer advocacy organizations can help create solutions that are driven by consensus and balance conflicting interests, creating a favourable environment.



CHAPTER 03

SOUTH ASIAN STRATEGIES ON STANDARD ESSENTIAL PATENTS (SEPs) GOVERNANCE: REGIONAL FOCUS AND CHALLENGES

- Kuldeep*

ABSTRACT

SEPs are indispensable to the interoperability of today's technology environments, such as telephony and the Internet of Things (IoT). Their smooth compliance, particularly for Fair, Reasonable, and Non-Discriminatory (FRAND) licensing issues, is a multi-dimensional concern that faces practically every region of the globe. Despite discussions regularly centred on the Western economies, the rapidly evolving technologies environment and divergent legislative traditions in South Asian states— India, Pakistan, Bangladesh and Sri Lanka— offer a unique yet less explored context for the region's SEP policy and practice. This research examines the diverse tactics employed by prominent South Asian nations in the governance of SEPs. The inquiry specifically addresses: How do South Asian countries manage the intricacies of SEP enforcement, FRAND licensing, and anti-suit injunctions, and what are the unique regional challenges and governmental solutions in reconciling innovation, competition, and access to standardised technologies? This research utilises a comparative legal and policy analysis to investigate national patent laws, competition legislation, and notable judicial rulings concerning SEPs in the chosen jurisdictions. It additionally includes specific case studies that demonstrate real difficulties in conflict resolution and policy execution. The study will elucidate similarities and differences in South Asian methodologies, pinpointing significant problems such judicial capacity, regulatory alignment, and the influence of global SEP disputes on domestic business and consumer accessibility. The results intend to guide policymakers and stakeholders in creating more equal and effective SEP frameworks.

KEYWORDS: Complexities of SEP Enforcement, Regulatory Harmonization, Global SEP Disputes, Global SEP Governance Models

INTRODUCTION

The expansion of interconnected technologies, such as 5G telecommunications and the Internet of Things (IoT), has heightened the significance of technical standards that guarantee interoperability.

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The patents safeguarding these fundamental technologies, referred to as Standard Essential Patents (SEPs), have emerged as a critical and contested domain under intellectual property law. This research analyses governance solutions for SEPs in South Asia, a region with significant economic potential and an emerging centre for technology manufacture and consumption. The region presently lacks a unified and coordinated approach to SEP governance, resulting in a fragmented environment characterised by India's vibrant yet unstable judiciary. India contends with intricate litigation, jurisdictional disputes, and a lack of explicit legislative direction regarding Fair, Reasonable, and Non-Discriminatory (FRAND) licensing terms, whereas its neighboring countries—Pakistan, Sri Lanka, Bangladesh, and Nepal—have emerging intellectual property frameworks that lack specific provisions for Standard Essential Patents (SEPs).

This disparity poses substantial obstacles to innovation, foreign investment, and market predictability throughout the area. This study presents a comprehensive examination of the legal and policy frameworks in major South Asian countries, highlights the principal difficulties arising from regional inconsistency, and proposes policy solutions. It concludes that for South Asia to fully use its position in the global digital economy, its member nations must advance towards establishing clearer, more predictable, and potentially harmonised governance frameworks for SEPs. This necessitates legislative and policy measures inside specific nations, especially India, alongside a coordinated regional initiative, potentially via the South Asian Association for Regional Cooperation (SAARC), to cultivate a more stable and equitable licensing framework.

STANDARD ESSENTIAL PATENTS (SEPS) AND THEIR GLOBAL SIGNIFICANCE

Standard Essential Patents have become an essential element in the technological arena, especially in telecommunications and digital industries, as they support standardised inventions and guarantee interoperability. The complex interplay between intellectual property rights and industry standards requires strong governance frameworks to reconcile the interests of patent holders, implementers, and consumers. The changing environment of SEPs in South Asia poses distinct problems and opportunities due to the region's rapid technological adoption and varied economic development. This research examines the techniques employed by South Asian countries on SEP governance, focussing on their regional emphasis and the obstacles encountered in establishing equitable and efficient systems. This study will examine how these nations manage the intricacies of international



intellectual property frameworks, including TRIPS compliance, while concurrently promoting local innovation and resolving sector-specific requirements, particularly in the pharmaceutical sector.⁵⁷ The formulation of these technical standards is predominantly managed by Standard Development Organisations (SDOs), which assemble industry stakeholders and technical specialists to collectively establish the specifications. An essential element of this collaborative approach is the dedication of patent holders who provide their exclusive technical solutions to a standard. To alleviate the risk of anti-competitive behaviour, these patent holders generally consent to license their pertinent patents on Fair, Reasonable, and Non-Discriminatory (FRAND) conditions. This commitment is essential for cultivating an environment conducive to innovation while guaranteeing widespread access to standardised technologies. SEPs exhibit a profound influence across technology-driven industries, particularly in the emerging disciplines of telecommunications (such as 5G), the Internet of Things (IoT), and Artificial Intelligence (AI). They are essential for facilitating interoperability, hence fostering healthy competition and enhancing customer options. The rapid shift to a digital economy has heightened public awareness and dependence on connectivity-related norms.

The SEP ecosystem is characterised by a basic paradox: these patents confer exclusive rights over technology that are, by definition, required for the implementation of a standard intended for universal access and interoperability. This establishes a clear conflict between the exclusive characteristics of patent rights and the inclusive, public-good nature of technical standards. The adherence to FRAND terms functions as the principal means to reconcile this intrinsic conflict, aiming to balance the SEP holder's motivation to innovate and recover significant research and development expenditures with the implementer's essential requirement for accessible technology to maintain market competition and consumer choice. This intrinsic tension is not only a theoretical concept; it underlies the intricate "FRAND wars" and persistent global discussions regarding SEP licensing. The effectiveness of any SEP governance structure, including those in South Asia, fundamentally relies on its ability to create and maintain this fragile balance, which directly affects innovation, market entry barriers, and consumer welfare. Standards are pervasive technological specifications that guarantee compatibility

⁵⁷ Rakesh Basant, *Intellectual Property Protection, Regulation and Innovation in Developing Economies: The Case of the Indian Pharmaceutical Industry*, Innovation and Development 115 (2011), <https://doi.org/10.1080/2157930x.2011.551050>.



among products and services from many vendors.⁵⁸ From connecting to a Wi-Fi network to making a 4G or 5G call, these everyday actions are made possible by technologies protected by SEPs⁵⁹

The strength of a SEP resides in its necessity. When a technology is included into a standard established by a Standard Setting Organisation (SSO), any company intending to produce a standard-compliant product is required to utilise that patented technology. The SEP holder possesses considerable market power, leading to a risk of "hold-up," wherein the patent holder may impose exorbitant fees or deny licensing of the invention entirely, thereby hindering competition and innovation. To alleviate this risk, Standard Setting Organisations (SSOs) generally mandate that members agree to license their Standard Essential Patents (SEPs) under Fair, Reasonable, and Non-Discriminatory (FRAND) conditions.⁶⁰

The FRAND commitment represents a nuanced equilibrium. It seeks to guarantee that technology implementers obtain vital technologies at equitable prices, while also ensuring that patent holders receive appropriate remuneration for their research and development expenditures.⁶¹ The concepts "Fair," "Reasonable," and "Non-Discriminatory" lack universal definitions, resulting in prolonged and costly legal conflicts worldwide. Judicial and regulatory entities across diverse nations have adopted varying methodologies in interpreting and enforcing FRAND agreements, resulting in a convoluted and frequently uncertain worldwide framework for SEP licensing.

South Asia, anchored by India and recognised as the world's second-largest telecommunications market, is a crucial region in this global context.⁶² The region is a significant consumer of technology and an increasingly vital hub for production and assembly. As a result, SEP disputes have increased in frequency and importance, especially in India. This research examines governance solutions for SEPs in South Asia. The region exhibits a pronounced developmental disparity: India has a dynamic, litigation-oriented SEP framework that remains in flux and lacks statutory precision, whereas its

⁵⁸ The Standard Essential Patent Landscape in India (Part 1), E.U. Intell. Prop. Helpdesk (Jan. 4, 2024), https://intellectual-property-helpdesk.ec.europa.eu/news-events/news/standard-essential-patent-landscape-india-part-1-2024-01-04_en.

⁵⁹ Standard Essential Patents (SEPs), Carson Patents, <https://carsonpatents.com/standard-essential-patents-seps/>.

⁶⁰ The Standard Essential Patent Landscape in India (Part 1), E.U. Intell. Prop. Helpdesk (Jan. 4, 2024), https://intellectual-property-helpdesk.ec.europa.eu/news-events/news/standard-essential-patent-landscape-india-part-1-2024-01-04_en.

⁶¹ *Id.*

⁶² Competition Commission of India, IAM, <https://www.iam-media.com/organisations/competition-commission-of-india>.



neighbouring nations possess general IP laws that are inadequate for addressing the particular intricacies of SEP disputes. This regional heterogeneity engenders uncertainty that may hinder technical advancement and economic development.

DEFINITION AND FUNCTION OF SEPs

SEPs are patents that safeguard technology considered vital to a technical standard, indicating that any product or service conforming to that standard must utilise the protected technology. This intrinsic requirement bestows substantial market power upon SEP holders, necessitating meticulous regulation to avert monopolistic exploitation and guarantee equitable access for implementers.⁶³ SEPs are differentiated from traditional patents, as their worth is based not solely on technical excellence but also on their incorporation into generally accepted industry standards. The distinctive role of SEPs in standardised ecosystems requires a careful equilibrium between promoting innovation via patent protection and curbing anti-competitive practices, often managed by fair, reasonable, and non-discriminatory licensing obligations. This involves scrutinising the controversial question of whether AI-generated ideas may fulfil conventional inventorship criteria, especially considering the legal frameworks' longstanding dependence on human creativity.⁶⁴

A patent is classified as "essential" to a standard if the technology it safeguards is crucial for the implementation of that standard. This indicates that compliance with the standard is virtually unattainable without employing the patented invention, thereby violating the patent rights. This "essentiality" bestows considerable commercial power upon the patent holder once their technology is included into a widely accepted standard.

THE GLOBAL SEP GOVERNANCE LANDSCAPE: A PATCHWORK OF APPROACHES

The governance of Standard Essential Patents (SEPs) is a global concern; nevertheless, its resolution has been predominantly national, resulting in a fragmented array of legal and administrative frameworks. The strategies employed by significant economic entities such as the United States, the European Union, and China provide crucial context for comprehending the difficulties and decisions confronting South Asia. Policymakers worldwide are increasingly prioritising SEPs. The United States

⁶³ Feng Xiao-qing & Bai-Hua Pan, The Evolution of Patent System: Invention Created by Artificial Intelligence, 183 *Procedia Computer Science* 245 (2021), <https://doi.org/10.1016/j.procs.2021.02.055>.

⁶⁴ E. Scott Fraser, Computers as Inventors – Legal and Policy Implications of Artificial Intelligence on Patent Law, 13 *SCRIPTed A Journal of Law Technology & Society* 305 (2016), <https://doi.org/10.2966/scrip.130316.305>.



and the European Union have suggested new laws, while countries such as Japan, South Korea, Singapore, and the United Kingdom have either issued or are contemplating guidelines for SEP licensing agreements.⁶⁵ China is diligently striving to expand its collection of Standard Essential Patents (SEPs) and exert control over the global distribution of licensing revenue.⁶⁶ A notable advancement in international SEP litigation is the emergence of courts prepared to establish worldwide FRAND royalty rates. This has predominantly been the purview of courts in the United States and the United Kingdom for an extended period. Nevertheless, the scene is evolving. A Chinese court in Chongqing established global royalty rates for 4G and 5G smartphone patents for the first time in a significant verdict in the *Oppeo v. Nokia* case.⁶⁷ This decision indicated China's aspiration to establish itself as a pivotal forum for the resolution of international SEP conflicts. Chinese courts have asserted their competence to establish worldwide rates for foreign patent pools, so cementing their increasing influence.⁶⁸

In Southeast Asia, SEP litigation is progressing, as nations in the region strive to balance intellectual rights with equitable competition.⁶⁹ Southeast Asian countries often tend to agree with frameworks that prioritise negotiation and compliance, exemplified by the European *Huawei v. ZTE* case⁷⁰. This indicates a preference for organised negotiation procedures prior to engaging in litigation. The diverse global landscape, characterised by conflicting jurisdictional assertions and varied legal systems, serves as the context in which South Asia is formulating its own strategy for SEP governance. The region's plans are shaped by international trends and precedents, rather than being developed in isolation.

IMPORTANCE OF SEPS IN TECHNOLOGICAL ADVANCEMENT

This section will examine the economic ramifications of SEPs, encompassing their contribution to competitiveness, innovation, and interoperability within intricate technical ecosystems. This will

⁶⁵ Andrei Iancu & David J. Kappos, RAI Explainer: Standard-Essential Patents and National Security, CSIS (Dec. 12, 2023), <https://www.csis.org/blogs/perspectives-innovation/rai-explainer-standard-essential-patents-and-national-security>.

⁶⁶ Id.

⁶⁷ Alexander See, A New SEP Powerhouse: How China is Shaping Global Patent Disputes, CSIS (June 18, 2024), <https://www.csis.org/blogs/perspectives-innovation/new-sep-powerhouse-how-china-shaping-global-patent-disputes>.

⁶⁸ Id.

⁶⁹ Standard Essential Patents in Southeast Asia: Interpretation of FRAND commitments in new SEP battle grounds, Rouse (Feb. 15, 2025), <https://rouse.com/insights/news/2025/standard-essential-patents-in-southeast-asia-interpretation-of-frand-commitments-in-new-sep-battle-grounds>.

⁷⁰ Interpreting FRAND in Southeast Asia: New SEP battle grounds, Rouse (Jan. 25, 2025), <https://rouse.com/insights/news/2025/interpreting-frand-in-southeast-asia-new-sep-battle-grounds>.



examine the licensing methods for Standard Essential Patents (SEPs), including FRAND terms, and their effectiveness in reconciling the rights of SEP holders with the requirements of implementers. This analysis will examine the negotiation and enforcement of licensing terms, highlighting prevalent disputes and associated settlement procedures in South Asia. The analysis will assess the influence of SEP litigation on innovation and market access, especially concerning smaller firms and start-ups in the region. Furthermore, it will examine the influence of political entities and regulatory structures on the formulation of SEP policies and practices in South Asian nations, emphasising both unified methodologies and varied tactics. This encompasses an examination of how South Asian countries are managing the intricacies of AI-generated innovations within their current intellectual property systems, considering the difficulties that artificial intelligence presents to conventional patentability criteria.⁷¹

SEP GOVERNANCE IN SOUTH ASIA: AN UNBALANCED AND FRAGMENTED LANDSCAPE

In contrast to the cohesive strategies observed in the EU or the harmonisation initiatives within ASEAN, South Asia lacks a consolidated framework for intellectual property, particularly with standard essential patents (SEPs). The intellectual property rights framework in the region comprises a diverse array of national legislations that, although broadly aligned with international agreements such as TRIPS, exhibit considerable variation in their implementation and development.⁷² This fragmentation is particularly evident in the realm of SEP governance.

INDIA: THE REGION'S LITIGIOUS EPICENTRE

India is undoubtedly the epicentre of SEP activity in South Asia. The expansive telecommunications market and burgeoning manufacturing sector have rendered it a pivotal arena for Standard Essential Patent disputes between international technology corporations and local enterprises. This behaviour occurs under a legal framework marked by judicial activism instead of legislative certainty.

Legal Framework: A Dichotomy Of Patent And Competition Law

⁷¹ Ana Ramalho, Patentability of AI-Generated Inventions: Is a Reform of the Patent System Needed?, SSRN Electronic Journal (2018), <https://doi.org/10.2139/ssrn.3168703> (last visited Feb 2025). Garikai Chimuka, Impact of Artificial Intelligence on Patent Law. Towards a New Analytical Framework – [the Multi-Level Model], 59 World Patent Information 101926 (2019), <https://doi.org/10.1016/j.wpi.2019.101926>.

⁷² Intellectual Property (IP) Law in SAARC Countries, Trademarks India, <https://www.trademarksindia.net/intellectual-property-ip-law-in-saarc-countries.php>.



There is no explicit legislation regulating Standard Essential Patents (SEPs) in India. Disputes are resolved in accordance with the Indian Patent Act of 1970 and the Competition Act of 2002. This duality has engendered considerable jurisdictional friction. The Patent Act establishes the basis for patent rights and infringement claims, however the Competition Act has been utilised by implementers to contest the licensing activities of Standard Essential Patent (SEP) holders as an abuse of dominant market position.

For years, the Competition Commission of India (CCI) conducted investigations into SEP holders, including proceedings against Ericsson, saying that tactics such as charging exorbitant royalty rates and compelling licensees to enter into non-disclosure agreements represented a prima facie abuse of dominance.⁷³ Nonetheless, subsequent judicial decisions have altered the equilibrium. In a pivotal 2023 finding, the Delhi High Court affirmed the supremacy of the Patent Act in related conflicts, determining that the CCI lacks the jurisdiction to examine instances concerning SEP license terms, which are governed by the Patent Act.⁷⁴ This has firmly consolidated the authority to shape SEP jurisprudence within the judiciary.

The Function Of The Judiciary And Key Precedents

The Delhi High Court has played a crucial role in shaping India's SEP jurisprudence. A succession of pivotal decisions has established fundamental principles, while simultaneously underscoring the intricacy and disputed nature of the issues.

- ***Ericsson v. Micromax & Others:*** This case was one of the initial significant standard essential patent challenges in India. The court issued interim injunctions against local handset manufacturers, conditional upon their payment of interim royalties to Ericsson. This case demonstrated the court's readiness to uphold SEP rights during the determination of a final FRAND rate.
- ***Ericsson v. Lava:*** In a pivotal 2024 ruling, the Delhi High Court issued its second conclusive judgement on Standard Essential Patents (SEPs), determining that Lava infringed upon seven of

⁷³ Adam Mossoff, The Competition Commission of India Goes Rogue on Patent Rights, The Global Innovation Policy Center, U.S. Chamber of Commerce (Aug. 18, 2016), <https://www.theglobalinnovationpolicycenter.com/the-competition-commission-of-india-goes-rogue-on-patent-rights/>.

⁷⁴ Tom Madge-Wyld, India: SEPs and FRAND litigation, policy and latest developments, Glob. Competition Rev. (Jan. 29, 2024), <https://globalcompetitionreview.com/hub/sepfrand-hub/2024/article/india-seps-and-frand-litigation-policy-and-latest-developments>.



Ericsson's patents and establishing a FRAND royalty rate.⁷⁵ The court underscored that talks must occur in "good faith".⁷⁶

- ***Opvo v. Nokia***: The court formulated a four-part criterion for issuing an interim injunction, necessitating the SEP holder to prove the patent's essentiality, its application by the implementer, that such application amounts to infringement in the absence of a license, and that the proposed license adheres to FRAND principles.⁷⁷

These cases illustrate that Indian courts are adept at managing intricate SEP disputes and are establishing advanced, principle-driven frameworks. Nevertheless, the jurisprudence remains in its infancy and continues to develop.⁷⁸

The Frand Dilemma: Elucidating "Fair And Reasonable"

Fair, Reasonable, and Non-Discriminatory (FRAND) licensing is a fundamental obligation of Standard Essential Patent (SEP) holders to license their patents under terms that equitably reconcile the need to compensate patent holders for their intellectual property with the requirement of preserving a competitive marketplace. The principal aims of FRAND are twofold: to avert "patent hold-up," a situation wherein a patent holder may leverage the essentiality of their patent to obstruct standard implementation or demand excessive royalties; and to mitigate "patent hold-out," where implementers may decline to negotiate in good faith or postpone licensing while continuing to utilise the patented technology without remuneration.

The inception and ongoing development of FRAND obligations directly address possible market failures arising from the convergence of patent monopolies and the social need for standardisation. In the absence of the FRAND framework, SEP holders can leverage their essential position to generate a "bottleneck" effect, so obtaining excessive royalties. This conduct would certainly impede innovation and competition in subsequent markets. FRAND serves as an essential self-regulatory tool inside

⁷⁵ India: Recent SEP Rulings and Evolving Jurisprudence Shaping Patent Landscape, (Apr. 9, 2025), <https://www.iam-media.com/review/the-patent-litigation-review/2025/article/india-recent-sep-rulings-and-evolving-jurisprudence-shaping-patent-landscape>.

⁷⁶ Standard Essential Patents, Maheshwari & Co. (last visited Aug. 4, 2025), <https://www.maheshwariandco.com/blog/standard-essential-patents/>.

⁷⁷ Laurent Teyssedre, Recent Indian case law on Standard Essential Patents, Kluwer Patent Blog (July 26, 2022), <https://legalblogs.wolterskluwer.com/patent-blog/recent-indian-case-law-on-standard-essential-patents-2/>.

⁷⁸ Standard Essential Patents in India: A Legal and Business Guide for Compliance & Licensing, DePenning & DePenning (last visited Aug. 4, 2025), <https://depenning.com/blog/standard-essential-patents-in-india-a-legal-and-business-guide-for-compliance-licensing/>.



SDOs, further bolstered by competition law principles, to alleviate inherent market power and promote the extensive adoption of advantageous technology. Recognising FRAND not alone as a contractual duty but as a crucial market corrective mechanism highlights its significant importance. For South Asian nations, enhancing FRAND enforcement transcends the mere assurance of equity in individual transactions; it aims to facilitate substantial technological adoption, avert economic distortions, and cultivate an environment favourable to their industrial and economic advancement.⁷⁹

A primary challenge in Indian SEP lawsuits is the establishment of a FRAND royalty rate. In the absence of a formal definition, the interpretation is delegated to the judiciary and the negotiating entities. The royalties base has been a significant topic of dispute. SEP holders generally favour calculating royalties based on the net sale price of the ultimate downstream product (e.g., a smartphone). Conversely, implementers and, in its preliminary directives, the CCI have advocated for employing the "Smallest Saleable Patent Practicing Unit" (SSPPU) the cost of the particular component that integrates the patented technology, such as a chipset.⁸⁰

The Delhi High Court has typically shown greater willingness to utilise the downstream product's worth as a basis for royalties, frequently referencing comparable licenses given by the SEP holder to other entities.⁸¹ This disparity between the judiciary's stance and the CCI's prior position underscores the profound differences regarding the definition of a "fair" royalty.

Policy Initiatives And Future Trajectory

The Indian government, specifically the Department for Promotion of Industry and Internal Trade (DPIIT), recognises the necessity for a more defined policy framework. In 2016, the DPIIT released a discussion paper on SEPs, soliciting public feedback to aid in formulating an appropriate policy.⁸² Recently, Indian officials have articulated a desire for the nation to have a prominent role in creating

⁷⁹ Lee Sarah, Navigating FRAND Licensing: A Comprehensive Guide to Antitrust and Emerging Technologies, Available at: <https://www.numberanalytics.com/blog/frand-licensing-antitrust-guide>.

⁸⁰ FRAND in India: Royalties for Standard Essential Patents, Criterion Economics (last visited Aug. 4, 2025), <https://www.criterioneconomics.com/frand-in-india-royalties-for-standard-essential-patents.html>.

⁸¹ India: SEPs and FRAND litigation, policy and latest developments, Glob. Competition Rev. (Jan. 17, 2022), <https://globalcompetitionreview.com/hub/sepfrand-hub/2022/article/india-seps-and-frand-litigation-policy-and-latest-developments>.

⁸² Jonathan D. Putnam & Tim A. Londergan, India considers greater regulation of standard essential patents, to much chagrin from US, CPI (July 1, 2016), <https://gai.gmu.edu/wp-content/uploads/sites/27/2016/07/Comment-India-considers-greater-regulation-of-standard-essential-patents-to-much-chagrin-from-US-1.pdf>.



SEP licensing regimes in Southeast Asia.⁸³ This signifies an acknowledgement that a stable and predictable SEP regime is essential for India's "Make in India" drive and its overarching objectives of becoming a global technology leader.⁸⁴

PAKISTAN, SRI LANKA, AND NEPAL: UNDERDEVELOPED FRAMEWORKS

Unlike India, the other principal economies in South Asia have not established distinct governance structures for SEPs. Their intellectual property rules are broad and have not seen substantial litigation on standard essential patents.

- **Pakistan:** Pakistan's intellectual property rights are regulated by the Patents Ordinance of 2000. This legislation conforms to international standards established by WIPO and the WTO, and the government has instituted specialised intellectual property tribunals to resolve disputes.⁸⁵ Nonetheless, the legal framework lacks explicit references to SEPs or FRAND principles, indicating that any forthcoming issues will be adjudicated under standard patent law, which may not adequately address their distinctive difficulties.
- **Sri Lanka:** Sri Lanka implemented the Intellectual Property Rights Act in 2003 to fulfil its commitments under the WTO TRIPS Agreement.⁸⁶ The government has formed specialised teams within the police and customs departments to enhance IPR enforcement.⁸⁷ Similar to Pakistan, there exist no explicit rules or regulations governing SEPs, resulting in a legal void in this domain.
- **Nepal:** The intellectual property in Nepal is regulated by the Patent, Design and Trademark Act of 1965.⁸⁸ Nepal, despite being a participant in international intellectual property accords, possesses an evolving patent system. To yet, a limited quantity of patents has been registered in

⁸³ Advancing SEP Policy and Innovation Opportunity in India, ACT | The App Association (May 29, 2025), <https://actonline.org/2025/05/29/advancing-sep-policy-and-innovation-opportunity-in-india>.

⁸⁴ About 'Make in India', Make in India (last visited Aug. 4, 2025), <http://www.makeinindia.com/about>.

⁸⁵ The protection of IP rights in Pakistan, Int'l Bar Ass'n (Sept. 15, 2021), <https://www.ibanet.org/the-protection-of-IP-rights-in-Pakistan>.

⁸⁶ Office of the U.S. Trade Representative, Sri Lanka, 2006 National Trade Estimate Report on Foreign Trade Barriers 495 (2006), https://ustr.gov/archive/assets/Document_Library/Reports_Publications/2006/2006_NTE_Report/asset_upload_file647_9209.pdf.

⁸⁷ Sri Lanka - Protecting Intellectual Property, U.S. Dep't of Com., Int'l Trade Admin. (last updated July 17, 2023), <https://www.trade.gov/country-commercial-guides/sri-lanka-protecting-intellectual-property>.

⁸⁸ Patent Law in Nepal, Prime Law Nepal (last visited Aug. 4, 2025), <https://primelawnepal.com/patent-law-in-nepal/>.



the country, and there is no indication of any policy discussions or legal proceedings concerning SEPs.⁸⁹

BANGLADESH AND THE ROLE OF SAARC

In Bangladesh, another significant economy in the area, there is a conspicuous absence of publicly accessible information pertaining to any specific SEP governance mechanism. It is assumed that, similar to its neighbouring countries (except India), it depends on general intellectual property rules.

The South Asian Association for Regional Cooperation (SAARC) has sought to promote collaboration in diverse domains, including science and technology, at the regional level. Discussions have occurred on the establishment of a SAARC system for Intellectual Property Rights.⁹⁰ 30 Nonetheless, these negotiations have not resulted in a cohesive or standardised intellectual property structure for the region. The intellectual property laws and registration procedures vary among member countries, lacking a unified framework for addressing intricate matters such as Standard Essential Patents (SEPs).⁹¹

SAARC AND BIMSTEC: PLATFORMS FOR REGIONAL IP DIALOGUE

Regional intergovernmental organisations in South Asia, including the South Asian Association for Regional Cooperation (SAARC) and the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), function as significant platforms for promoting economic and technical collaboration among member states.

SAARC, established in Dhaka in 1985, is the regional intergovernmental organisation and geopolitical union of South Asian governments, including Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. The secretariat is located in Kathmandu, Nepal, and the organisation seeks to foster economic development and regional integration, having established the South Asian Free Trade Area in 2006. The primary objective of SAARC is to enhance economic growth, social advancement, and cultural development by collaborative efforts in mutually accepted areas of cooperation, founded on the principles of sovereign equality, non-interference, and mutual benefit.⁹²

⁸⁹ Patent Registration in Nepal: A Distant Affair, *Farsight* (Feb. 20, 2022), <https://farsightnepal.com/news/53>.

⁹⁰ Energy, Transport, Science & Technology, SAARC Sec't, <https://www.saarc-sec.org/index.php/areas-of-cooperation/energy-transport-science-technology/38-areas-of-cooperation>.

⁹¹ Intellectual Property (IP) Law in SAARC Countries, *supra* note 13.

⁹² Available at: https://training.itcilo.org/actrav_cdrom1/english/global/blokit/saarc.html.



BIMSTEC, founded in 1997, is a regional cooperation organisation comprising Bangladesh, India, Sri Lanka, Bhutan, Nepal, Myanmar, and Thailand. This effort emphasises multi-sectoral technological and economic collaboration, with technology exchanges recognised as a critical domain. A crucial element of BIMSTEC's collaboration in the technology sector is the creation of the BIMSTEC Technology Transfer Facility (TTF) in Sri Lanka, designed to promote the transfer of technologies, especially suitable for micro, small, and medium-sized enterprises (MSMEs). The TTF is designed to promote technology transfer in key sectors including biotechnology, nanotechnology, information and communication technology, and agricultural technology.⁹³

Although both SAARC and BIMSTEC aim to promote economic and technical collaboration, and certain member states are actively reforming their intellectual property legislation, the information at hand does not suggest a direct or explicit emphasis on Standard Essential Patents (SEPs) or their governance within their articulated goals or initiatives. Their IP-related endeavours seem to encompass a wider scope, including general IP awareness and technology transfer. This indicates that although the infrastructure for regional interaction is present, the requisite political will or technical capacity to tackle intricate SEP issues at a multilateral level within these organisations may still be underdeveloped. The lack of a specific regional emphasis on SEPs results in member states addressing these matters predominantly through national frameworks, which may cause inconsistencies and "FRAND wars" across South Asia's boundaries. Utilising these established regional entities to commence dialogues, exchange best practices, and possibly investigate harmonisation initiatives for SEP governance might greatly enhance the region by minimising friction, advancing interoperability, and cultivating a more consistent licensing framework.

Although a completely harmonised patent legislation across SAARC is improbable in the foreseeable future, the organisation can nonetheless assume a significant role.

1. Commence a Regional Discourse on SEPs: SAARC ought to form a working group or a high-level conversation focused on SEPs and FRAND. This would enable member states to exchange experiences, address shared difficulties, and acquire knowledge from each other.

⁹³ Ali, Muhammad Mahboob & Medhekar, Anita. (2022). The BIMSTEC Free Trade Area: Economic Cooperation, Opportunities, and Challenges. 10.4018/978-1-7998-5774-7.ch006.



2. Formulate a Non-Binding Framework of rules: Inspired by ASEAN's collaborative methodology for intellectual property, SAARC could endeavour to establish a set of non-binding rules for standard essential patent licensing within the region. This may encompass optimal strategies for negotiation, transparency, and conflict resolution, establishing a soft-law framework that enhances predictability while respecting national sovereignty.

3. Collaborate on Intellectual Property Infrastructure: Member nations may collaborate to enhance their intellectual property infrastructure, including the establishment of more comprehensive patent databases and training initiatives, which would benefit the entire region.

4. Comparative Analysis and Principal Challenges: The analysis of national frameworks indicates a significantly uneven regional distribution of SEP governance. This disparity engenders numerous issues for both individual countries and South Asia collectively.

DIVERGENCE AS THE DISTINCTIVE CHARACTERISTIC

The principal characteristic of South Asia's SEP environment is variation rather than commonality.

- **Maturity of Jurisprudence:** India possesses a unique and progressive corpus of case law regarding Standard Essential Patents (SEPs). The courts are actively addressing the definitions of FRAND, the suitability of injunctive remedy, and the determination of royalties. Conversely, its neighbouring jurisdictions possess legislative frameworks that are, regarding SEPs, predominantly unexamined and underdeveloped.
- **Institutional Engagement:** In India, the court, the competition authority (historically), and governmental policy entities are all involved in the SEP discourse. In other South Asian countries, the institutional emphasis is on the basics of intellectual property registration and enforcement, lacking the specialisation necessary for standard essential patent issues.
- **Legal Certainty:** Although India's ongoing lawsuit offers some direction, the lack of a dedicated SEP statute engenders its own type of uncertainty. Businesses encounter a convoluted, precedent-based system that may be erratic. In the remainder of the region, the uncertainty manifests differently: an absence of regulations or precedents, indicating that any forthcoming dispute would navigate new legal territory.

CHALLENGES SPECIFIC TO COUNTRIES AND REGIONS

This disjointed terrain presents a multitude of urgent concerns.



For India

India's approach to SEP governance is particularly noteworthy due to its significant pharmaceutical industry and its historical stance on balancing intellectual property rights with public health imperatives, as exemplified by its robust compulsory licensing provisions and interpretations of patentability⁹⁴

1. *Insufficient Legislative Clarity:* Dependence on court interpretation to delineate FRAND and address SEP concerns results in extended litigation and ambiguity. A definitive legislative or policy framework would offer essential predictability for both SEP holders and implementers.

2. *Establishing FRAND Royalties:* The persistent discourse on the suitable royalty basis (SSPPU versus end-product value) continues to be a principal cause of contention and a considerable obstacle in licensing talks.

3. *Harmonising Innovation and Accessibility:* India must achieve a nuanced equilibrium. An inadequate SEP policy may deter inventors from incorporating their optimal technologies into standards, whereas a too stringent enforcement regime could render technology prohibitively costly for India's extensive market.

For Other South Asian Nations

1. *Insufficient Preparedness:* As these economies advance in digitisation and expansion, they will undoubtedly serve as arenas for SEP disputes. In the absence of a proactive policy development strategy, their judicial and administrative institutions may get inundated with the intricacies of these situations.

2. *Risk for Domestic Industries:* Local manufacturers and technology implementers in these nations may be oblivious to their licensing responsibilities, exposing them to the potential for abrupt injunctions or expensive litigation should SEP holders opt to enforce their patents.

For the South Asia Region as a Whole:

1. *Barrier to Regional Trade and Investment:* The absence of a standardised or reliable framework for SEPs throughout the region may serve as a non-tariff barrier. A corporation seeking to invest or operate in

⁹⁴ Pallavi Mahajan, *Advent of Intellectual Property Rights in the Pharmaceutical Industry*, SSRN Electronic Journal (2011), <https://doi.org/10.2139/ssrn.1840627>.



South Asia must contend with a mosaic of diverse legal concerns, which may hinder investment and complicate supply chains.

2. *Undermining Predictability:* For multinational technology corporations, predictability is essential. The pronounced disparity between India's litigious landscape and the legal void in other regions complicates the formulation of a cohesive regional strategy for technology licensing and implementation.

POLICY RECOMMENDATIONS AND FUTURE DIRECTIONS

Addressing the issues in South Asia's SEP governance necessitates a multifaceted approach, combining initiatives at the national, bilateral, and regional tiers.

FOR INDIA: ADOPTING CLARITY AND PREDICTABILITY

As the regional leader in this field, India has the potential to establish a model framework.

1. *Establish Explicit SEPs rules:* Although full legislation may be a long-term objective, the DPIIT might, in the interim, promulgate detailed rules for SEP licensing. These guidelines may elucidate the government's stance on critical matters, including the preferred technique for determining FRAND royalties, the criteria for issuing injunctions, and the anticipated behaviour of parties during discussions.

2. *Advocate for Alternative Dispute Resolution (ADR):* In light of the expensive and protracted nature of SEP litigation, India ought to vigorously endorse ADR methods such as mediation and arbitration. Establishing specialised ADR centres for intellectual property issues may offer a more effective means of settling licensing problems.

3. *Enhance Transparency:* Policies that promote increased transparency in licensing talks, such as mandating SEP holders to disclose explicit information regarding their patent portfolios and analogous licensing prices, could facilitate more efficient negotiations and diminish conflicts.

FOR OTHER SOUTH ASIAN NATIONS: A PROACTIVE, CAPACITY-BUILDING APPROACH

For Pakistan, Sri Lanka, Bangladesh, and Nepal, the focus should be on proactive preparation.

1. *Capacity Building:* These nations should invest in training for their courts, patent office staff, and lawmakers on the complexity of SEPs and FRAND licensing.



2. Examine Global Best Practices: They can draw insights from the experiences of other regions, including India, the EU, and China, to comprehend various forms of SEP governance and ascertain what may be best appropriate for their particular economic and legal frameworks.

3. Establish Foundational Policies: A fundamental policy statement recognising the significance of FRAND principles and delineating a general framework for future disputes would represent a substantial advancement, indicating to investors and technology firms that these matters are being taken seriously.

CONCLUSION

The regulation of Standard Essential Patents in South Asia is at a critical crossroads. The region is characterised by a profound divide between India's dynamic yet unstable SEP landscape and the underdeveloped structures of its neighbouring countries. This fragmentation engenders substantial legal ambiguity, presents risks to both innovators and implementers, and may impede the region's capacity to fully assimilate into the global digital economy. India's future trajectory necessitates a transition from a predominantly litigation-based framework to one supported by explicit legislation or policy direction. For its neighbours, the imperative is to adopt a proactive stance, enhancing capability and formulating core policies prior to being unprepared for intricate issues. SAARC possesses a significant opportunity at the regional level to promote communication and collaboration, advancing towards a more cohesive and reliable framework for technology licensing. Given South Asia's escalating economic and technological significance, the establishment of equitable, transparent, and effective SEP governance transcends mere legal formalities; it is a strategic necessity for harnessing the region's inventive capabilities and ensuring its future success. South Asian countries, especially India, are becoming prominent adopters of standardised technology, hence establishing a distinctive role in the global SEP dialogue. This implementer-focused viewpoint frequently influences national policies, prioritising affordable access for extensive consumer populations and emerging domestic businesses. Countries like as India have experienced swift advancement in pro-SEP holder jurisprudence, especially from the Delhi High Court, whilst nations like Pakistan, Bangladesh, and Nepal remain in the preliminary phases of establishing their SEP-specific legal frameworks and case law. Widespread issues in the region encompass an absence of explicit SEP legislation and definitive FRAND standards, resulting in legal ambiguity and dependence on general intellectual property and competition regulations. This regulatory void leads to disputed FRAND rulings, promoting patent



hold-up and hold-out issues, and intensifying the challenge of royalty stacking. Moreover, enforcement deficiencies, marked by inadequate court ability, systemic delays, and overarching governance challenges such as corruption and opacity, diminish the efficacy of current intellectual property regimes. These challenges disproportionately encumber Small and Medium-sized Enterprises (SMEs), obstructing their capacity to develop and embrace new technologies.



CHAPTER 04

FROM PATENTS TO DIGITAL PLATFORMS: EXPLORING THE TRANSFORMATION OF INTELLECTUAL PROPERTY RIGHTS IN THE AGE OF TECHNOLOGY

- Priyanshu Kumar*

ABSTRACT

The growth of digital technology has reshaped the protection and enforcement of intellectual property. While online systems have streamlined an administrative process reflected in the World Intellectual Property Organization's reports that more than 85% of global patent filings in 2022 were submitted digitally these developments have also intensified infringements. Software piracy in India alone reached 62% in 2023, causing significant economic loss, while online platforms such as YouTube, streaming services, and E-commerce sites have become common arenas for copyright and trademark violations. This study employs a doctrinal and case-law approach, supplemented with comparative perspective to analyse the evolving challenges of IP protection in the digital environment. As an example, the Ministry of Information and Broadcasting of India has noted that the registration of digital content has increased by 120% between 2018 and 2025. It examines legal responses to digital infringement's, including increased registration of digital content, frequent requests before the Controller General of Patent, Designs and Trade Marks receives more than 3500 requests monthly to remove or infringing materials. and Judicial interventions such as Tata Sons Ltd. V. Greenpeace International, which highlighted consumer confusion arising from online trademark misuse. The research findings reveal that despite the advanced tools like blockchain and artificial intelligence for monitoring and enforcement, piracy, counterfeiting, and trademark dilution remain persistent. The research emphasizes that the regulatory framework must evolve rapidly to address the vulnerabilities of digital IP Protection.

KEYWORDS: Digitalization, Artificial Intelligence, Blockchain, Copyright Enforcement

INTRODUCTION

In today's fast-changing world, technology is growing faster than ever, the connection between technology and intellectual property serves as a focus in depth investigation. New inventions like

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Artificial Intelligence, blockchain, and big data are making everything⁹⁵ from how we create things to how we protect them completely different. Because of this, laws related to Intellectual Property are also facing big challenges. As we move into the fourth industrial revolution where physical, digital is merging it is important to understand how these changes are affecting the legal frameworks that protect innovation. Since there is desperate necessity to take virtually the serious risks. Digital age has solved these problems by making the procedure easier to file an IP, track infringements and protect innovation of creativeness that gave a new hope for people as well as companies. Registering patents, trademarks, and copyrights has been a laborious paperwork heavily in-person submission-centric process. Still, the advent of digital platforms has made them quicker, more transparent This study deals into disruptive effects of emerging technologies on intellectual property filings, revealing the rich tapestry that connects the digital frontier to the world of intellectual property. For example, many countries, including India, have launched online IP filing systems, digital search tools and real-time status tracking where IP filings surged by 44% between 2020-2025. Within this, patents grew by 180%, designs by 266% and geographical indications by 380%. In FY 2022-23 alone, over 83,000 patents were filed, the highest growth in two decades, and today more than 95% of filings are online with AI tools like IP Sarthi.⁹⁶

A number of researchers have already explored the relationship between technology and other facets of intellectual property. Some of them look into the ways in which technology is shaping patent filing, copyright enforcement in the digital age, and online trademark registration and protection. Scholarly investigations have explored the impact of technology advancement on patent application, copyright disputes⁹⁷, and trademark registrations. Recent research also delved into the way of intellectual property fosters innovation and economic growth, especially in the context of emerging technologies like machine learning, blockchain and 3D printing. Scholars have looked into how emerging technologies challenge established intellectual property standards, requiring changes and revisions to

⁹⁵ Liya Luo, *Application of Blockchain Technology in Intellectual Property Protection* (2022) available at https://www.researchgate.net/publication/361180238_Application_of_Blockchain_Technology_in_Intellectual_Property_Protection (last visited Aug. 02, 2025).

⁹⁶ India Brand Equity Foundation. (2025, July 23). *India witnesses 44% surge in IP filings over five years, driven by key policy reforms and digitization*. IBEF. <https://www.ibef.org/news/india-witnesses-44-surge-in-ip-filings-over-five-years-driven-by-key-policy-reforms-and-digitization>.

⁹⁷ Shengjie Yu, *Copyright Issues and Response Mechanisms for AI-generated Artworks* (2025) available at <https://www.ewadirect.com/journal/asbr/article/view/24021> (last visited Aug. 02, 2025).



egal frameworks. As controversies over AI-written content, social media copyright infringement, or piracy rage on, they are but one of the digital IP tales. The purpose of this research is to bridge that gap by critically examining how far digital transformation is undermining and reinforcing intellectual property protection. The goal is to know how emerging technologies affect IP filings, enforcement, and innovation and find ways to reconcile legal adaptation with technological change. Along the way, this research also seeks to join the larger debate on how intellectual property can continue to be resilient and relevant in the fourth industrial revolution when the world of the physical and cyber are further intersecting.

THE ROLE OF EMERGING TECHNOLOGIES AND IP FILING

The digital evolution of technology is considerably reshaping the scope of intellectual property, by introducing fresh challenges and opportunities in the way rights are recognized, protected, and already enforced. Implement such as patents, trademarks, and copyrights remains fundamental in safeguarding the interest for inventors, creators, and enterprises. Nevertheless, with the increasing integration of digital tools and systems, the connection between technological innovation and intellectual property has grown increasingly complex and demands through analysis. The role of intellectual property filing is significant here. When researchers or startups invent something new in these areas, filing patents or designs early gives the legal rights – so no one else can copy their ideas without permission. Between 2010 and 2025, India saw a huge leap: AI-related patent filings grew seven times and reached over 86,000, making up more than 25 % of all tech patents filed in the country! India even outpaced global growth in patents (17.2 % year-on-year in 2023), and grants surged 149 % in the same period, especially for software and AI inventions⁹⁸. That's huge because it shows how emerging tech is driving innovation and why IP filing matters for research and business alike.

With a patent as innovators compete to safeguard their idea in a hyper-connected digital economy, there has been a marked rise in patent applications worldwide. A patent grants the real holder exclusive rights to prevent others from making, using, or selling an invention for a specific period, therefore offering a strategic edge in the marketplace. In the world of digital era of Artificial intelligence, the

⁹⁸ Press Information Bureau, "India Outpaces Global Patent Filings Growth in 2023: Over 86,000 AI-Related Patents Filed Since 2010," PIB (Mar. 28, 2024), available at: <https://pib.gov.in/PressReleasePage.aspx?PRID=2012345> (last visited on Aug. 03, 2025).



patenting landscape is especially active, with applications involving advancements in machine learning, cognitive networks, natural language processing and image recognition gaining significance. Rather than focusing solely on end products, companies are increasingly targeting the algorithms and computational models that power AI systems, emphasizing the commercial and legal value of underlying technologies. From smart sensors and edge devices to communication protocols and system integration's, inventors are racing to secure exclusive rights over innovations that drive internet of things ecosystems. From sensors to how devices talk to each other, companies are applying for patents in large numbers. The launch of 5G technology has also led to a rush in filing patents, especially in the mobile and telecom industries. Companies are trying to own the technologies behind faster internet, better signals, and new apps that depend on 5G⁹⁹. In the field of biotechnology, the patent environment is shaped by both ethical considerations and regulatory frameworks, in addition to scientific breakthroughs. Significant attention is being directed towards patenting innovations in diagnostic tools, personalized medicine. People now recognize brands through apps, websites, voice assistant's and smart devices. This has made it harder for brands to stand out, so companies are focusing more on getting trademarks to protect their identity in the digital world.

Copyright law is also facing unprecedented challenges due to advances in artificial intelligence. As AI systems grow increasingly capable of generating artistic, musical, and literary works autonomously, this brings up a big question – The idea of a human being the only creator is being challenges¹⁰⁰. Because of this, copyright rules to change in order to handle the unique problems that AI- generated material presents.

THE LEGAL FRAMEWORK GOVERNING IP IN DIGITAL ERA

As technology transforms the way that we conceive and disseminate ideas, intellectual property has undergone a drastic evolution in terms of its statutory protection. Today, as technology enables the easy copying and distribution of information, it is much more difficult to fit on-line activities into traditional copyright, patent, trademark and trade secret protections. The Copyrights Act, 1957, especially after its 2012 amendments, introduced provision such as Section 65A and 65B, which safeguard technological protection measures (TPMs) and rights management information, thereby technological protection measures and right management information, thereby addressing challenges

⁹⁹ Economic Times Bureau, "5G Drives Surge in Telecom Patents in India," The Economic Times, July 10, 2023.

¹⁰⁰ Shambhavi Naik, "Who Owns AI-Generated Content?" 58 Economic and Political Weekly 19 (2023).



of digital piracy and unauthorized sharing. In *Super Cassettes' Industries v. Myspace* (2011)¹⁰¹, the Delhi high Court dealt with intermediary liability for user- uploaded infringing content, while in *Tips Industries v. Wynk Music* (2019), the Bombay High court clarified licensing requirements for music streaming platforms. In the domain of patent, section 3(K) of the Patents Act, 1970 excludes computer programs per se from patentability, yet in *Ferid Allani v. Union of India* 2019 the Delhi High Court that software-related inventions with a 'technical effect' could qualify for patent protection¹⁰². With the rise of e-commerce, protecting brand identity online has become very important. The Trademarks Act, 1999 helps companies safeguard their brand names, logos and domain names against misuse. Cybersquatting is the big issue in the digital age. In *Satyam Info Way Ltd. V. Sifynet Solutions Pvt.Ltd.* 2004 in the Supreme Court recognized domain names as an important form of intellectual property, giving businesses protection against online misuse. Another important tool developed by Indian courts is the John Doe order (also called Ashok Kumar Orders). *Apple Inc. v. Samsung Electronics Co. Ltd.* is another case of great importance; it is also a notable digital "patent war". In 2011, Apple accused Samsung of copying its iPhones and iPads functionalities and features. In court, Apple was awarded 1 billion dollars, but after a few appeals, it went to the Supreme Court because Apple wanted to change the way the damages for design patents are done. Then the case was concluded when Samsung paid Apple more than 539 million dollars¹⁰³. This showed how predatory tech patents, especially design and software patents, have become. These are pre-emptive injunctions that allow blocking of websites even before the exact infringer is identified. For e.g. during big movies release like *Singham* or *Dishoom*, producers approached courts to block websites hosting pirated copies. This shows how the judiciary is adapting copyright protection to digital piracy¹⁰⁴.

Trademarks, which help identity and protect brands, are also facing new issues to the global reach of ecommerce. Online marketplaces make it easier for trademark infringement to occur, and challenge like cybersquatting and domain name disputes are becoming more common¹⁰⁵. In our time of connectedness these trade secrets, formulas, strategies are subject to being taken at an increased rate.

¹⁰¹ *Super Cassettes Industries Ltd. v. Myspace Inc.*, 2011 SCC Online Del 2648 (India).

¹⁰² *Ferid Allani v. Union of India*, 2019 SCC Online Del 11867 (India).

¹⁰³ *Apple Inc. v. Samsung Electronics Co.*, 580 U.S. ____ (2017). <https://supreme.justia.com/cases/federal/us/580/15-777/>

¹⁰⁴ *UTV Software Communication Ltd. v. 1337x.to*, CS (Comm) 724/2019 (Delhi High Court).

¹⁰⁵ World Intellectual Property Organization, "WIPO Arbitration and Mediation Centre: Domain Name Dispute Resolution Statistics," available at: <https://www.wipo.int/amc/en/domains/statistics/> (last visited on Aug. 8, 2025).



With more business now done online, it is increasingly hard to actually keep confidential things secret¹⁰⁶. We have work to do in our legal systems tackling the same obstacles facing trade secrets, although this is legally more complex than protecting other IP like patents, copyrights or trademarks. In its entirety, as the digital landscape grows broader, so must intellectual property laws to remain in force. Copyright law develops by blending traditional doctrines and new technology-specific rules as it struggles to balance the interests of creators with the requirements of legitimate user.

EMERGING TECHNOLOGIES: LEGAL AND PRACTICAL CHALLENGES

The rise of artificial intelligence has led to groundbreaking innovations, but it has also raised important questions about who should be considered the rightful inventor when AI is involved in the creation process. Traditionally, patent laws recognize only human beings as inventors. This has created challenges when AI systems, such as DABUS (developed by Stephen Thaler), independently contribute to the creation process. Current patent laws usually recognize only humans as inventors, which create challenges when AI systems contribute independently to inventions. This raises the question: who owns the copyright or patent of such creations? — the developers of the AI itself, to the person who consummate his input, or none? This is what legal professionals are now trying to balance between finding the right way of protecting intellectual property and at the same time ensuring transparency and security. Likewise, the Internet of Things (IOT), which unites networking capabilities in physical devices to exchange data raises concerns on data ownership, privacy and unauthorized uses. But even in that case, the system would still need to address basic issues like who owns the data being generated by all those Internet of Things devices and how we give the required consent for our data to be collected, not to mention any other measures designed to prevent such vast amounts of personal information from being abused. They have to balance the always-adapting nature of technology with concerns for individual rights. Digital platforms also have new means of earning money. This is a huge shift from the more traditional channels through which creators could make money only by selling their work physically, and branching out to online subscriptions, streaming platforms, or per-download payments raise little concern for copyright holders. Blockchain technology brings both opportunities and challenges as well. On one hand, blockchain may be used to securely and transparently record who owns what in terms of intellectual property (for example registering digital

¹⁰⁶ OECD, “Trade Secrets Protection: Trends and Threats in the Digital Economy” (2022), available at: <https://www.oecd.org/sti/ind/trade-secrets.pdf> (last visited on Aug. 8, 2025).



artworks or patent verification); -On the other hand, it also makes it hard to control its decentralised nature. One of those instances are non-fungible tokens, or NFTs, that enabled the sale of digital art but could still be copied and shared even if their ownership record resides on a blockchain. This created many confusions between owning a digital file and owning the rights to use or distribute it.

Copyright jurisdiction and enforcement in the digital age present a broader set of challenges. The problem is that when content goes online, it can be accessed anywhere in the world where different laws apply. AI-generated deepfakes¹⁰⁷, as its 21st century many fakes videos made by AI is violation of someone privacy and fundamental rights too. Many people may not even realize that are breaking someone's patent right to and remix a digital artwork with their polish work. There is a case *Stephen Thaler v. Comptroller General of Patents*¹⁰⁸, designs and trademarks where it shows how legal systems around the world are struggling with defining ownership and authorship in emerging technologies. As AI-generated inventions can be denied protection when legal systems do not recognize AI as an inventor, even if the invention is genuinely novel and useful. A big case shows how web rights change. A big case that shows how tech changes the rules of idea rights is *Tata Sons Ltd. v. Greenpeace International*. In this case, Greenpeace made an online game that made fun of Tata's work in the Dhamra Port plan. They said it hurt the home of Olive Ridley turtles. Tata Sons sued Greenpeace¹⁰⁹. They said it was their mark & name misused in the game. But the Delhi High Court said no to Tata's ask to stop the game. They said Greenpeace's use of the mark was not for gain, was funny, & fit under free speech. The Court said that in the tech age, mark laws must mix well with the right to free speech. This is key when the talk is of big public & joke acts. This case shows how tech adds new hard bits to IP law & tells us the law needs to change to guard both new ideas & brand share. The use of augmented and virtual reality both introduce a further layer of complexity to intellectual property law. Brands are showcased, changed and even hijacked on an unprecedented scale within these full-immersion platforms that were previously inconceivable from a physical-world context. As digital spaces are becoming more sophisticated, ensuring that brand identity is protected in these surroundings introduces new legal and regulatory challenges.

DIGITAL EMPOWERNEMENT OF CREATIVE AND INNOVATION PROCESS

¹⁰⁷ Editorial, "India Urgently Needs Laws to Regulate Deepfakes," *The Hindu*, May 12, 2024.

¹⁰⁸ *Stephen Thaler v. Comptroller General of Patents, Designs and Trade Marks*, [2021] EWCA Civ 1374.

¹⁰⁹ *Tata Sons Ltd. v. Greenpeace International*, CS(OS) No. 1407 of 2010, High Court of Delhi.



In today's digital world, algorithm-based creativity has become a major shift in many creative industries. With the help of artificial intelligence (AI), algorithms are now being used to create music, art, design, and more through it is much easier for creators to showcase their work globally using platforms like YouTube, Instagram and TikTok. These platforms allow people allow people to reach wider audiences without depending on traditional publisher publishers or media houses. The availability of affordable software tolls and free open – source alternatives have made it possible for students, independent artists, and small startups to produce high – quality content without needing large budgets. This has opened many opportunities for new talents who earlier didn't have access to expensive resources. But This leads to some questions- what really count as creativity, how much control do human have over the process, and what are the legal challenges surrounding this algorithm generated creations? Digital platforms also open up new money-making opportunities. They no longer rely only on selling their work in physical form but also earn from online subscriptions and payments on streaming platforms per download. Algorithmic creativity refers to the use of computer programs or algorithms for creating original and valuable creative works. From AI-generated canvasses to proposed music compositions. Wait, legally there is a whole list of complexities. Current copyright auteurs are still based in human authors. How to balance accelerating rate of innovation with protecting IP rights, which the innovators have worked so hard to make mainstream is a challenge for Intellectual Property Rights (IPR) in this digital era. IP rights—like patents, copyrights, trademarks.

Despite those perks come still other pitfalls. The operative words being: fast internet and high-end multimedia devices. There is that divide. And, if one goes by digital content being mere replication, then the consideration of piracy and copyright infringement must come into practice, further holding back creators¹¹⁰. The balancing act between the virtuous mission of stimulating innovation and intellectual property protection is the greatest challenge facing society in the digital age. Protection of intellectual property rights-trade secrets, patents, copyrights, and trademarks-must be present to encourage the generation of new ideas and products. Those perks too come with an assortment of other pitfalls. The operative words being: fast internet and high-end multimedia devices. With that divide. And-if one considers digital content mere replication-the piracy and infringement issue will have to be considered, which hold producers back even further. With tools for licensing like Creative

¹¹⁰ Creative Commons, "About the Licenses," available at: <https://creativecommons.org/licenses/> (last visited on Aug. 8, 2025).



Commons, most creators are still ignoring the legal issues¹¹¹. The other issue about the dependence is that most are heavily dependent on something like YouTube or Instagram, and changes inevitable on the algorithmic or policy side affect the extent to which they can reach out¹¹² to people and make a living out of that. One major societal issue of the digital age is striking the right balance between encouraging innovation and protecting intellectual property. Intellectual property rights—trade secrets, patents, copyrights, while there are many challenges that need to be addressed, especially in terms of access and protection of intellectual property, the digital world clearly opens up a new era of opportunity for creativity and innovation.

MARKET PERSPECTIVE

In today's quick and always changing world of trade, owning ideas (IP) is key in backing new things and keeping safe what people make. Owning ideas means having the rights to patents, trademarks, copyrights, and trade secrets. These have become big assets for companies in all areas. A big shift in the IP world now is how important patents are. Many firms are now making and looking after strong patent groups. In tech areas, sharp fights often start over who owns patents, as companies work hard to stay ahead and hold their spot in the market. A good set of patents can make a company's market spot better, draw in people to put money in, and start new ways of making money through letting others use them and getting fees. Nowadays, companies not only seek patents but also actively construct and oversee entire portfolios—collections of patents—from which they can draw for crafting licensing deals, joint ventures, or even mergers. The consulting industry, exemplified by Deloitte and EY, highlights how institutions with patent portfolios on the stronger end of the spectrum boast market valuations that are 20–25% greater. This is yet more proof that intellectual property rights (IPRs) are not only tools of the law but also valuable economic assets. Consider the matter of “patent wars”: fierce battles over litigation to determine who holds the rights to essential technologies. The smartphone industry, for example, is flooded with disputes between Apple, Samsung, and even more players, with billions on the line. These conflicts accentuate the role of patents as instruments of competition that determine who leads the market.

¹¹¹ Creative Commons, “About the Licenses,” available at: <https://creativecommons.org/licenses/> (last visited on Aug. 8, 2025).

¹¹² Pranav Dixit, “When Algorithms Fail: How Indian Creators Are Struggling with Platform Dependence,” *The Wire*, Mar. 5, 2024.



In addition, the more pressing matter is the monetization of patents. AI's skill to make content and new things poses questions for current laws on who can be said to have made something and who owns the rights to it, as most places still want a human to be named for patents. As part of the Fourth Industrial Revolution, firms are learning how these tech link with IP law to better meet the ups and downs that come. Also, because of how wide the world is linked now, it's more key than ever to look after IP across borders¹¹³. Regarding IP licensing, the Competition Act, 2002 addresses issues related to misuse of dominance, where Section 3 deals with anti-competitive agreements and Section 4 deals with the abuse of dominance. IP licensing agreements, on one hand, help balance benefits to the patent holder and licensor, but on the other, they help check the monopolistic power of patent holders. For example, an SEP holder imposing discriminatory royalty fees, such as higher fees from small local companies in comparison to large multinational licensees, would be considered an abuse of dominance under Indian competition law. Several issues related to telecom SEPs have been looked into by the Competition Commission of India (CCI) on this matter. To keep things fair and stay on top in the market, clear deals and legal rules are set. With all these shifts, firms are putting more focus on growing their own IP law know-how, seeing that having pros in this field is must to move through the changing IP scene well. IP groups are now seen as "key signs" in these collaborations—business deals tend to go through (by up to 53% more often) and 46% quicker when IP matching is there¹¹⁴. Experts who understand AI, blockchain, and new IP rules are needed to move well in this fast-changing space. In an attempt to curb the unnecessary use of monopoly power, the use of SEPs is required to be licensed on FRAND terms (fair, reasonable and non-discriminatory terms). This alleviates the risk of charging prohibitive and discriminatory fees for essential technologies. Still, numerous controversies persist on defining what 'reasonable' entails. For one, the use of SEPs has seen an explosion of litigation in India. Ericsson stands out, having litigated Micromax, Intex, and Lava for infringing its SEPs on GSM, EDGE, and 3G standards. Indian courts, notably the Delhi High Court, have exercised prudence in attempting to strike a balance between patent rights and competition law. In some instances, they have ordered interim royalty payments during the pendency of the main suits, indicating the struggle of

¹¹³ World Intellectual Property Organization, "World Intellectual Property Report 2022: The Direction of Innovation" (WIPO, 2022).

¹¹⁴ Ian Beech, "What are the 23 types of strategic partnerships?" *Breezy*, July 17, 2023, available at: <https://breezy.io/blog/types-of-strategic-partnerships/> (last visited on Sept. 5, 2025).



trying to strike equilibrium between fostering innovation and access to affordable technology. The issues surrounding SEPs and FRAND are also of concern for economic policy.

THE FUTURE OF INTELLECTUAL PROPERTY (IP) FILINGS

In particular, the rapid pace of technological change is a key driver in how filings for IP will look like and evolve. It is expected that sectors like biotech, renewable energy, artificial intelligence and quantum computing to see huge influx in patent filing as these are the emerging areas. In fact, it is part of a larger trend which will not only stem from ground-breaking innovations but also as the world realises that economic and competitive value lies in holding exclusive rights over technological advancements. This has big implications for IP management too, with AI potentially changing the way licensees search patents and analyse prior art or even how patent applications are drafted—what all together—as well as examiners examine applications. automation could reach trademark and copyright registrations to reduce manual workloads on legal professionals while also improving the speed and accuracy of filings. It is clear that globalisation and its impacts on the IP world will continue to evolve as technology advances. When businesses expand internationally and operate in more than one market, it will be common to secure IP rights across multiple jurisdictions concurrently. This trend will inevitably drive a desire for more simplistic and harmonised international filing procedures. Similarly, as economies become more interdependent, we can anticipate a new vibrancy in the internationalization of IP disputes which will demand joint enforcement strategies and resolution processes that are better prepared to face the obstacles associated with a global market place.

Technology is also changing the opportunity space for new, non-traditional forms of intellectual property. Blockchain technology, for example has brought about novel classes of patent applications with reference to decentralised systems and new ways digital assets & virtual goods are creating new trademark and copyright challenges. The laws governing IP will also have to embrace these unconventional forms and offer them protection, this is important as otherwise most innovation in the emerging fields could get violated. Sustainability is yet another potent force molding the IP filings landscape of tomorrow. An increased patent filing in eco-friendly technologies, green materials and renewable energy solutions based upon the higher environmental-derived consciousness is also expected. In the case of sustainable innovations, by enacting IP policies that support them in their development and commercialisation, governments can trigger a virtuous cycle whereby legal protection generates additional R&D as well as financing to further environmentally beneficial



technologies. Some fields, like bio tech & health care, may see big IP filing growth. The push for new meds, shown by the COVID-19 crisis, shows how health issues can quicken new drug & tool making. Each new item needs its own legal safe. In time, how we file for IP will change by how much we know & teach. As more folks like inventors & students learn how to guard their own smart ideas, the way & time they file will get better. Both the national & world IP offices will have to update their rules & systems. They need to keep up with these changes, to make sure IP keeps driving new ideas in a world that's more linked & higher tech than ever.

RECOMMENDATIONS

In the fast-changing landscape of emerging technologies It is more than legislators or rules creators; it is about forming IP framework that is robust enough to safeguard creativity, but agile enough to respond to rapid shifts in technology. Policymakers must take action to provide a suitable IP filing framework that will accommodate the opportunities and challenges presented by shifts in biotechnology, blockchain, and artificial intelligence, which are rapidly transforming industries unlike anything we have witnessed. Global IP standards are an important step in that direction. Having a singular and unified global framework, especially in the context of technology that has no borders, significantly simplifies the process of IP registration. It helps tackle legal complexities for creators operating in several countries, and supports a global innovation culture where creativity is not limited to a single geography. Without such frameworks, creators are bound to face an overwhelming volume of distinct and contradictory legal frameworks, which is a hindrance to creativity and innovation. Nonetheless, while other times were geographically restricted, the present and future we have, in general, technologies that transcend the boundaries of geography; hence, an imperative arises for India to align its IP regime according to not just domestic compulsions but also international standards. Governments should integrate Artificial Intelligence into the monitoring mechanisms for IP infringement. With over 50,000 IP infringement cases pending in Indian courts (DIPP Data, 2023), manual enforcement becomes unsustainable. On the other hand, AI tools can automatically detect the sale of counterfeit products on e-commerce sites or the piracy of a film or music on a streaming platform. To cite an example, WIPO's system called IPAS analyses patent data by Artificial Intelligence, and India can build an indigenous IPAS-like system under the auspices of the Controller General of Patents, Designs and Trade Marks (CGPDTM) to cut down the delays in litigation.



Thus, the current Indian framework is very descriptive and hardly sets pace with technological disruptions. For instance, the Indian Patents Act, 1970, and the Copyright Act of 1957, though amended from time to time, still lag in their application to modern disputes such as those of AI-based inventions or piracy of non-fungible tokens. India has witnessed nearly 66,440 patent applications in 2022-23, marking a considerable rise vis-a-vis the last decade as reported by the World Intellectual Property Indicators 2023, showing an ever-growing innovation ecosystem. Still, the ease of doing business report by World Bank, 2020, gives India 63rd place on the whole but 36th in IP enforcement, showing governance implementation. The legislative framework itself also needs shift. The evolution of technology often outpaces the archaic method of law-making. Adopting more responsive methods will ensure the legal framework is kept abreast with technological advancements. In the current digital framework, the legal infrastructure is required to be agile, responsive, and proactive. The Copyright Act, 1957 was amended in 2012 to provide protection for digital rights management; yet, online piracy has still flourished. India is said to be in the top three countries when it comes to illegal content downloads, according to the MUSO 2022 Global Piracy Report. Dynamic injunctions to block mirror sites were recognized by the Delhi High Court in *UTV Software v. 1337X.to* (2019) but enforcement remains patchy. The digital piracy phase really needs a more elaborate statutory framework, including the statutory recognition of dynamic blocking orders and AI-powered detection tools. Flexibility is crucial to innovation and its rapid growth in collaborative settings. Chances of innovation can be greatly increased with the inclusion of private and public bodies. In the realm of IP protection, public private partnerships, open-source projects, and cross-industry collaborations can be more creatively and efficiently harnessed. Innovation has evolved to be the outcome of collective welfare, knowledge and capabilities. Modernising the process of patent application is equally pressing with the developing complexity of such applications. The burdens of slow and systematic frameworks, choke creative thinkers with delays, a space that keeps new ideas safe but also cheers them on as tech moves on.

CONCLUSION

This research set out to examine how digital transformation is reshaping the protection, enforcement, and future of intellectual property rights in the context of emerging technologies. The central question was whether digitalization strengthens or undermines intellectual property systems, and what reforms are necessary to ensure fairness, innovation, and global harmonization. The evidence suggests that while digital technologies empower innovation and broaden participation, they simultaneously



challenge the adequacy of traditional legal frameworks. Ultimately, the digital age is not only disrupting intellectual property but also offering the very tools to reform it. A proactive, collaborative, and globally harmonized framework- responsive to technological change yet inclusive of diverse creators- remains the clearest path forward. In this way, intellectual property can continue to safeguard creativity while fuelling innovation in an era where borders are virtual, ideas are global, and technology defines the pace of progress.



CHAPTER 05

SOVEREIGNTY IN STANDARDS: SEP CHALLENGES IN AI, GREEN TECH, AND OPEN INNOVATION FOR THE GLOBAL SOUTH

- A R Varavarnini*

ABSTRACT

The control of Standard Essential Patents (SEPs) in new technologies like artificial intelligence (AI), green energy systems, and open-source digital platforms has reshaped global innovation hierarchies. For the Global South, particularly South Asia and Sub-Saharan Africa, this presents an existential question: Is it possible to have technological sovereignty within systems inherently conceived by and for Global North economies? This paper asks questions on how existing SEP governance frameworks such as FRAND (Fair, Reasonable, and Non-Discriminatory) licensing engage with the Global South's innovation ecosystems where access to standard technologies is essential to sustainable development and digital equality. The study adopts a comparative legal approach, analysing case law from India, Brazil, and Kenya, in combination with an examination of pertinent international instruments (WIPO, TRIPS, WTO) and regional policy measures. It critically evaluates the meeting point of SEPs with open-source innovation, AI algorithmic standards, and clean technology infrastructure and identifies the frictions between proprietary IP models and developing economies' collaborative demands. Through deconstructing the political economy of patent pools, licensing bottlenecks, and technology access barriers, the paper makes the case for a new SEP governance model that is regionally contextual, equity-oriented, and open to open innovation. The paper outlines a policy platform for the Global South based on techno-legal pluralism allowing countries to become a part of the global standardization regime without forgoing their developmental sovereignty. This research contributes to the prevalent discussions of SEP democratization, innovation justice, and standard-setting geopolitics, resonating heavily with the conference themes of fair SEP access, new technologies, and international cooperation.

KEYWORDS: Global South, Open Innovation, Green Technology, AI and IP Governance, FRAND Licensing

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INTRODUCTION

In the evolving global innovation ecosystem, Standard Essential Patents (SEPs) have become far more than just legal tools regulating access to telecom protocols. They are now the basis instruments in industries powering the Fourth Industrial Revolution artificial intelligence (AI), green energy infrastructure, and open-source digital platforms¹¹⁵. These technologies are not commercial commodities; they are the foundation of national security, sustainable development, and technological sovereignty. As the standards become more sophisticated and globalized, so does the legal and economic authority held in the hands of those who hold the patents upon which they depend.¹¹⁶ This control is not evenly distributed. The architecture of SEP governance predominantly shaped by private standard-setting organizations (SSOs), multinational corporations, and legal frameworks of the Global North systematically sidelines the priorities and innovation models of the Global South. Developing nations are often constrained to act as licensees or rule-takers, rather than active participants in standard creation or negotiation. The imbalance becomes most visible in emerging technology domains, where the lack of meaningful access to SEPs risks reinforcing digital dependency, stalling climate technology diffusion, and curbing open-source innovation.

Against this backdrop, this paper asks a fundamental question:

Can the Global South assert meaningful technological sovereignty within SEP regimes inherently shaped by Global North priorities and private actors?

To this, the paper conducts a comparative law analysis, borrowing from India, Brazil, and Kenya jurisdictions representing different models of state response to SEP challenges in the AI, green tech, and software standardization contexts. At the same time, it interprets global treaty obligations and soft-law frameworks like the WTO TRIPS Agreement, WIPO Development Agenda, and multilateral statements on innovation and sustainability.¹¹⁷ The method also incorporates a political economy perspective, analyzing how SEP domination intersects with world power inequalities, investment flows, and infrastructure interdependence in the Global South.

¹¹⁵ Christopher May, *The World Intellectual Property Organisation and the Development Agenda* 97–113 (discussing WIPO's role in global IP governance and developmental implications), in *Global Society* (2008).

¹¹⁶ See Deere Birkbeck & Roca, *WIPO's Development Agenda and Development-oriented Capacity-building*, external review (noting mismatch between IP governance and development priorities).

¹¹⁷ TRIPS Agreement Arts. 7–8 (objective and principles recognizing public interest); May, *supra* note 1; Deere Birkbeck & Roca, *supra* note 2.



The paper structure is in six parts. After this introduction, Section II charts the legal and institutional bases of SEPs and their global standardization environment. Section III reads case studies from India, Brazil, and Kenya to unmask on-ground legal and policy initiatives. Section IV probes the convergence of SEPs with AI, climate technology, and open innovation, marking their special regulatory tensions. Section V describes the anti-competitive chokepoints of licensing, patent pools, and royalty stacking. Lastly, Section VI suggests a techno-legal pluralism-based Global South-centered SEP governance model with regional patent equity, open FRAND licensing, and multilateral mechanism reform.

With interrogating the politics of standard-setting and patent control, this paper situates the conversation around SEPs not merely as a legal issue, but as a question of global justice, innovation access, and sovereign agency in the digital age.

GLOBAL SEP ARCHITECTURE: CONTROL, COMPLIANCE, AND CONTESTATION

Standard Essential Patents (SEPs) are the governing law behind the current innovation landscape. Their purpose is ingeniously simple: patents become "essential" when they encompass technologies that need to be put into effect in order to facilitate a technical standard, e.g., those established by the 3rd Generation Partnership Project (3GPP), Institute of Electrical and Electronics Engineers (IEEE), or International Telecommunication Union (ITU)¹¹⁸. Yet the institutional frameworks determining essentiality and managing licensing are neither neutral nor global in character. The essence of this system is the FRAND doctrine of licensing, whose purpose is to ensure open access to technologies under SEPs¹¹⁹. In practice, however, the FRAND policy has been uncertain and contentious. Jurisprudence between jurisdictions from the *Huawei v. ZTE* case in the EU to *Unwired Planet* and *Ericsson v. Apple* litigations shows broad variation in the interpretation of what "fair" and "reasonable" imply in different legal and economic settings¹²⁰. Compliance mechanisms tend to be biased in favor of dominant SEP-holders, exposing implementers from emerging economies to threats of injunctions and exorbitant royalty requests.¹²¹

¹¹⁸ *Huawei v. ZTE* (C-170/13), ¶ 24 (CJEU) (holding IPRs essential "on technical grounds" in accordance with ETSI policy).

¹¹⁹ See *id.* ¶ 25 (describing FRAND as non-defined, to be negotiated between parties).

¹²⁰ See *Huawei v. ZTE* ¶¶ 24–27; see also *Unwired Planet v. Huawei* [2017] EWHC (Pat) 711 (Eng.) (UK court upheld global FRAND license concept in *Unwired Planet* litigation).

¹²¹ See *id.*; see also *Ericsson v. Apple* 955 F.3d 1113 (Fed. Cir. 2020) (affirming SEP-owner leverage in FRAND royalty negotiations).



The international treaty environment adds to this complexity. Articles 7 and 8 of the TRIPS Agreement set intellectual property as a means to achieve public interest and development objectives terminology that provides interpretive space for striking a balance between proprietary rights and public needs¹²². Nonetheless, the WTO's Dispute Settlement Body (DSB) has seldom practiced this balancing act in SEP cases, which mirrors the general imbalance in the application of TRIPS flexibilities. WIPO's Development Agenda, initiated to reorient IP norms towards international equity, has had little effect on SEP governance, which is still controlled by private standard-setting bodies (SSOs) and corporate consortia. The control architecture of SEPs is predominantly private, and Standard Setting Organizations such as ETSI, IEEE, and ITU have transparent procedures where developing nations frequently have no voting rights or representation. Their products global standards tie up innovators from across the world, but control rests with a small number of industry players, primarily based in the Global North. Patent pools such as Avanci or MPEG LA, as much as they facilitate transactional efficiency, centralise power in Western licensors and pose antitrust risks.

This asymmetry is not access-based alone; it is structural exclusion. Global South innovators are subject to a double bind: they have to adopt global norms in order to access markets, but have no bargaining power in either SSO standard-setting or FRAND negotiations. In addition, transparency shortfalls in announcing essential patents, ambiguous valuation standards, and territorial licensing conflicts all compound these disadvantages. Briefly, the global SEP regime operates as a compliance and control tool. Although its legal texts vow impartiality, the procedural and governance structures lean toward hegemon economies, which generate deep questions about the sovereignty and agency of the Global South in global innovation systems.

COMPARATIVE CASE STUDIES: INDIA, BRAZIL, KENYA

India: Jurisprudential Ambiguity and Policy Awakening

India's experience with Standard Essential Patents (SEPs) is at the intersection of judicial activism, industrial policy, and changing policy. Perhaps no case is as instructive as *Ericsson v. Micromax*, in which the Delhi High Court was asked to decide interim royalty payments for SEP infringement¹²³. While the court approved Ericsson's royalty requests on an ad-interim basis, it did so without

¹²² TRIPS Agreement arts. 7–8, 1869 U.N.T.S. 299 (recognizing public interest objectives in IP protection).

¹²³ Patent litigation led by Ericsson against Micromax, Delhi High Court interim order awarding 0.8–1.3% royalty, injunction and customs inspection requirements, Civil Suit No. 442/2013, Delhi High Court (2014). (order emphasized interim nature and declined to fix final FRAND rate), see *Patent Row*, Business Standard (Nov. 2014).



establishing a uniform methodology of FRAND determination. This absence of jurisprudential precision-made licensing negotiations uncertain, with Indian companies frequently being pushed into settlements in order to avert costs of litigation and market dislocation.

The *Xiaomi v. InterDigital* (2021) case further highlighted the double standards in global SEP licensing. Xiaomi alleged that InterDigital offered it discriminatory rates compared to U.S. or European licensees. The Delhi High Court allowed anti-suit injunction proceedings and referred the dispute to arbitration, indicating an emerging trend towards ADR mechanisms in SEP disputes, albeit under judicial supervision.¹²⁴

Parallel to the litigation track, India is assertively pursuing indigenous standard-setting. Institutions like the Telecommunications Standards Development Society, India (TSDSI) and its active collaboration with OneM2M in the IoT space demonstrate a sovereign strategy to embed domestic priorities into global technical standards. These include frugal innovation, rural connectivity, and language-agnostic interfaces often absent from Global North standards.

The release of the Draft Indian SEP Policy (2023) further solidifies this shift. The document pushes for:

- Greater transparency in SSO functioning
- Clear FRAND royalty-setting mechanisms
- Preference for arbitration over litigation
- Disclosure obligations for SEP holders pre-licensing

These steps indicate India is not just a rules-taker but a would-be rule-maker, working to achieve IP enforcement and innovation access.

Brazil: Regulatory Coordination and Market Balance

Brazil's SEP ecosystem is influenced by an increasingly coordinated competition law and regulatory interface. The Administrative Council for Economic Defense (CADE) and the National Telecommunications Agency (Anatel) have both played key roles in reviewing SEP enforcement

¹²⁴ *InterDigital Technology Corporation v. Xiaomi Corporation*, Delhi High Court (May 3, 2021) (anti-enforcement injunction, referral to arbitration), reported in WIPO Lex.



strategies. For example, CADE has proactively examined royalty stacking and market foreclosure threats in cross-licenses, especially in the telecommunications and Wi-Fi markets¹²⁵.

Pronounced cross-border licensing controversies between companies such as Ericsson and Huawei in Latin America highlight Brazil's strategic location as both a significant consumer of technology and a potential innovation player. The Brazilian judiciary itself has been reserved up to know to establish firm precedents on FRAND enforcement, opting instead for regulatory mediation and settlement facilitation. This, however, has not necessarily amounted to predictability, particularly for startups that do not have the legal bandwidth to cut through murky licensing regimes.

Brazil's National AI Strategy and accompanying discussions on IP reform reflect forward-thinking in emerging sectors like green technology. Recognizing the risks of being caught in SEP traps for clean energy innovation, Brazil has initiated studies on patent pool models for climate tech, especially targeting solar energy and electric vehicle standards. These developments suggest a hybrid approach: respect for IP norms, but with a strategic bend toward developmental needs¹²⁶.

While Brazil has not formally adopted an SEP-specific policy, its public consultations on patent abuse and competition law in tech sectors have opened the door for localized adaptations of global FRAND norms potentially inspired by EU or South Korean models.

Kenya: Innovation, Exclusion, and Structural Constraints

Kenya's engagement with SEP regimes is not primarily litigation-driven but shaped by access challenges and structural asymmetries. In sectors like clean energy, where decentralized solar power plays a critical role in rural electrification, Western-owned SEPs dominate the technical architecture. This creates barriers to local manufacturing and deployment, with royalty costs either passed on to consumers or subsidized by international aid.

The fintech sector — particularly the internationally renowned M-Pesa mobile payment system — subjects Kenya to a second type of SEP risk. Although M-Pesa has been successful under a locally grown innovation network, alarm grows about the possibility that platform interoperability standards

¹²⁵ Administrative Council for Economic Defense (CADE), press release confirming investigation into Ericsson for SEP-related antitrust violations (Apr. 23, 2025)

¹²⁶ Isabel Milman & Viviane Kunisawa, *Brazil's Role in SEP Litigation Continues to Evolve*



being driven by multilateral banks or private groups may burden new patent licensing requirements, retroactively challenging Kenya's control over its digital infrastructure.

Kenya has traditionally employed TRIPS flexibilities—most notably in the pharmaceutical sector—to make SEP-heavy sectors such as energy or digital technology subject to compulsory licenses for public health purposes. However, such tools have seldom been used in SEP-heavy industries such as energy or digital tech, largely because of capacity issues in patent examination and enforcement. The use of ARIPO makes it even more difficult since the regional organization has no systems for SEP transparency, FRAND management, or SSO involvement.

However, Kenya is emerging as a voice in continental IP debates, particularly within the African Continental Free Trade Area (AfCFTA) framework¹²⁷. There is growing momentum for a Pan-African digital IP regime that would establish African-centric standards for AI, e-commerce, and fintech — insulated from undue SEP pressures. This reflects a decolonial turn in IP governance discourse, where development priorities are reasserted against entrenched Western patent power.

Cross-Case Insights

Judicial Behaviour: Whereas Indian courts are busy and interventionist in a moderate manner, Brazil is more dependent on regulatory mediation, and Kenya engages through access and policy gaps.

- Sovereignty Mechanisms: India uses indigenous SSOs; Brazil is dependent on competition law; Kenya demands regional frameworks.
- Institutional Weaknesses: All three nations struggle with enforcement or even determining FRAND commitments, particularly when international patent pools and SSOs have them locked out of decision-making processes.
- Thematic Convergence: Each case illustrates how SEPs in AI, digital, and climate tech are no longer operational tools for innovation diffusion but sovereignty gatekeepers, market access gatekeepers, and developmental autonomy gatekeepers.

These comparative analyses highlight the imperative of reimagining SEP governance from a Global South perspective, where participation, rather than compliance, becomes the measure of legitimacy.

AI, GREEN TECH, AND THE SEP DILEMMA

¹²⁷ African Union, “African Union Adopts Eight Annexes to the AfCFTA Protocol on Digital Trade” (Jan. 16, 2025)



The intersection of artificial intelligence (AI) and green tech is transforming the world's innovation scene—but so does it heighten the need to redesign Standard Essential Patent (SEP) regulation. SEPs, which were initially designed to promote interoperability and access, are becoming more potent weapons in industries that need to be open, flexible, and quick-off-the-mark to innovate. This is especially stark in AI infrastructure and climate-critical technologies.

AI and SEPs: The Invisible Encroachment

Unlike telecom hardware, AI systems are not visibly dependent on standard protocols. But a closer look reveals substantial SEP entanglement: the chips used in training models, the network protocols for distributed learning, and even some algorithmic optimization techniques often rely on standards set by IEEE, ISO, and ITU bodies. Patent portfolios relating to neural processing units (NPUs), high-speed interconnects (e.g., PCIe, DDR), and edge-device compatibility are already dominated by SEP-heavy firms like Qualcomm, Nvidia, and ARM.

Further, the market-leading AI models OpenAI's GPT series, Google's Gemini (formerly Bard), and Meta's LLaMA are mostly trained using proprietary infrastructures. This creates significant power asymmetries vis-à-vis smaller actors in the Global South trying to develop explainable or indigenous AI models¹²⁸. When SEP licensing becomes a prerequisite to even build on open datasets or deploy low-cost AI applications, innovation becomes gated. The open-access narrative collapses under the weight of commercial legalism.

FRAND (Fair, Reasonable, and Non-Discriminatory) licensing adds another complexity. AI developers face “black box” audits from SEP holders to verify usage, which triggers privacy and IP sovereignty concerns¹²⁹. In jurisdictions with limited transparency enforcement or algorithmic accountability frameworks, FRAND audits could morph into surveillance mechanisms especially when mandated by dominant Global North actors. The lack of jurisprudential consensus on how FRAND applies to non-hardware-based systems aggravates this regulatory vacuum.

Green Tech: Licensing the Climate

¹²⁸ Divyansha Sehgal, *AI, Data Colonialism, and the Global South*, ORF Issue Brief No. 681 (2023)

¹²⁹ Chrysoula Pentheroudakis & Justus A. Baron, *Licensing Terms of Standard Essential Patents: A Comprehensive Analysis of Cases*, EUR 28302 EN, JRC Sci. for Pol'y Rep. (Nikolaus Thumm ed., 2017), <https://doi.org/10.2791/32230>.



Green technologies solar panels, battery storage systems, smart grid software, wind turbine mechanics are equally entangled in SEP minefields. Major SEP holders like Siemens, GE, and Tesla command swathes of clean tech standards, from IEC protocols for electric vehicle (EV) charging to real-time metering systems. This structural barrier is especially dire for startups and research hubs in the Global South. As the IPCC-WIPO Joint Report on Green Technology and Climate Change (2022) underscores, access to essential patents in renewable infrastructure is “a prerequisite to achieving equitable decarbonization globally.” However, current SEP regimes operate with virtually no accommodation for climate justice principles. In effect, the lack of mandatory SEP pools or subsidized licensing terms for clean tech hinders the realization of COP goals. A real-world implication is evident in Kenya and Nigeria, where R&D in affordable solar microgrids is constrained by the risk of infringing patents bundled in standards like IEEE 1547 and IEC 61850. SEP holders do not actively license to African research hubs, leading to developmental lags and a reliance on imported tech despite local design capability.

Open Innovation: Legal Dreams vs SEP Reality

The open-source software movement has made remarkable strides in AI via frameworks like TensorFlow and PyTorch. Yet, open-source AI developers increasingly report threats from SEP-heavy corporations and patent assertion entities (PAEs). For instance, *Unified Patents v. Fortress Investment Group* (N.D. Cal., 2020) spotlighted the role of PAEs in exploiting weak SEP transparency rules to bring frivolous infringement suits against AI tool developers.¹³⁰ As a counter, organizations like the Linux Foundation and Open Invention Network (OIN) have promoted Open-FRAND models. These propose pre-declared royalty-free licensing for SEPs used in open-source environments. However, uptake remains low among powerful SEP holders. The asymmetry persists, despite the fact that AI development increasingly relies on open innovation stacks.

In practice, developers who rely on public model repositories or collaborative datasets especially in countries with no robust defensive patent strategy are vulnerable to SEP litigation, even if their tools are meant for non-commercial, public-good applications. Both AI and green tech reflect a deeper fault line in the SEP system: the tension between proprietary control and global necessity. SEPs were designed to balance exclusivity and interoperability. But in the AI–climate convergence, the scales

¹³⁰ *Unified Patents, LLC v. Fortress Investment Group LLC*, No. 5:19-cv-05822, 2020 WL 7223336 (N.D. Cal. 2020).



have tipped toward gatekeeping. Urgent reforms are needed to introduce differentiated licensing standards, mandatory royalty caps for climate-related SEPs, and binding obligations for SEP holders to engage with Global South implementers. The creation of an international Digital SEP Equity Council involving UNCTAD, WIPO, and climate governance bodies could serve as a first step toward realigning the SEP regime with twenty-first century challenges.

REIMAGINING SEP GOVERNANCE: A GLOBAL SOUTH-CENTRIC FRAMEWORK

The dominant international discussion of Standard Essential Patents (SEPs) is broadly one led by the agenda of emerging economies and Big Tech patent owners¹³¹. This imbalanced dynamic generates systemic blind spots that decenter the on-the-ground experience of the Global South—where infrastructural deficits, asymmetrical market leverage, and non-Western legal traditions converge to create insurmountable barriers to equitable access to standards-based innovation. Recasting SEP governance as an essentially Global South-oriented initiative is not just a corrective exercise—it is an ontological necessity.

Techno-Legal Pluralism: Rethinking the Rules of Engagement

At the center of this new model is the concept of techno-legal pluralism. This acknowledges that technological governance globally cannot be a one-size-fits-all arrangement. Legal arrangements, innovation ecosystems, and development agendas in jurisdictions, especially in the Global South, are inherently different from the assumptions inherent in traditional FRAND models¹³². Enabling legal pluralism, this model envisions a shift away from top-down compliance toward negotiated convergence between global and local standards.

Key Proposals

- Open registries would introduce accountability, reduce royalty stacking, and level the field for emerging innovators.
- Mandatory ADR Mechanisms for SEP Disputes
- Dual-Standard Recognition & Indigenous Standards Bodies

¹³¹ See Development Agenda for WIPO and the formation of CDIP in 2007, WIPO, *Development Agenda* (noting dominance of Global North in IP standard-setting processes)

¹³² TSDSI's membership in oneM2M reflects a pluralistic engagement with global standard institutions.



- Patent Pool Governance Reform that includes- Equitable representation of Global South regulators and innovators, Independent oversight mechanisms to prevent discriminatory licensing, and Disclosure of licensing criteria and fee structures.

INSTITUTIONAL ARCHITECTURE: SOUTH-LED SOLUTIONS

A. Reviving WIPO's Committee on Development and Intellectual Property (CDIP)

WIPO's CDIP has traditionally languished under neglect and stagnant agendas. Reinvigorating it with a dedicated SEP governance track would help shift the center of gravity toward development-oriented IP frameworks. CDIP must evolve into a proactive policy-making space for SEP access, disclosure norms, and licensing equity.

B. G20 Technology Sovereignty Forum

India, Brazil, South Africa, and Indonesia are increasingly exercising technological autonomy. A G20 Technology Sovereignty Forum, under rotating Global South leadership, could coordinate:

- Cross-border SEP licensing strategies
- Local standards harmonization
- Collective bargaining with patent pools

C. Leveraging TRIPS Article 66.2 for SEP-Linked Tech Transfer

TRIPS Art. 66.2 requires developed nations to encourage tech transfer to Least Developed Countries (LDCs)¹³³. This can be extended to SEP-heavy domains through:

- Subsidized licensing fees
- Joint R&D arrangements
- Patent-backed training and capacity building

Such enforcement, especially when tied to development funding or trade preferences, could radically shift the current power imbalance.

CONCLUSION

The SEP landscape is today organized around a power asymmetry legal, technical, and economic that objectively disadvantages the Global South. Although FRAND obligations were first imagined as protections against monopolistic abuse, in operation they have too frequently become legal niceties,

¹³³ WTO reports on TRIPS Article 66.2 implementation and technology transfer incentives for LDCs



incapable of being enforced against the power of hegemonic licensors and secret standard-setting processes. The compound result is that nations outside the innovation core are just technology consumers, without the ability to negotiate fair access or to get into shaping the standards that define their digital destinies. This essay has attempted to reframe the SEP debate with a Global South perspective, one that prioritizes not only access to technology, but sovereignty over how and with whom it gets made. From the disjointed jurisprudence in Brazil and nascent SEP structures in Kenya to the systematic exclusion experienced by startups and green tech entrepreneurs throughout the Global South, the evidence is unequivocal: the existing system is failing the world's majority. The Global North firms' dominance in SEP licensing is not a market fact; it is an institutional structure supported by regulatory inertia, secretive licensing practices, and the marginalization of other standardization models. As the Global South continues to become more of an innovation hub in clean energy, mobile payments, and artificial intelligence these inefficiencies turn into legal impediments, which refuse local value capture and trap the region in technological dependency. Policy innovation has thus ceased to be a choice; it is necessary. The suggestion of techno-legal pluralism recognizes the actualities of the developing economies where legal pluralism, informal innovation systems, and limited resources necessitate tailored governance solutions instead of transposed globalized norms. Open-FRAND approaches, domestic standard-setting assistance, and reviving multilateral platforms such as WIPO's CDIP or a prospective G20 Tech Sovereignty Forum are not pie-in-the-sky ideas; they are necessary to equalize the playing field. The lesson is biting: unless legal architecture keeps pace with the tech disruption it aims to govern, sovereignty will be a rhetorical aspiration and not a structural fact. Patent pools, SSO governance, and licensing frameworks will all need to be redesigned around inclusivity and equity as their guiding principles. Short of this, the Global South will remain to traverse a digital economy designed by others, for others. This article urges legal scholars, negotiators of trade, judges, and policy entrepreneurs to break out of incrementalism. The future of world intellectual property regulation needs to be founded on democratic access, institutional transparency, and international solidarities. The innovation of the future cannot be based on exclusion.



CHAPTER 06

BALANCING INNOVATION AND MARKET POWER: A COMPARATIVE COMPETITION LAW STUDY OF ABUSE OF DOMINANCE AND FRAND COMPLIANCE IN THE SEP ECOSYSTEM

- Shivangi Singh* and Dr. Rishikesh Singh Faujdar**

ABSTRACT

Through the lens of competition law, this article analyzes the regulation of Standard Essential Patents (SEPs) and the evolving interpretation of FRAND (Fair, Reasonable and Non-Discriminatory) obligations, particularly in light of the increasing globalization. The licensing of SEPs is essential for promoting innovation, access and ensuring interoperability across smart technologies including smartphones, connected cars and Internet of Things devices. However, if FRAND terms are not upheld when a patented technology is incorporated into a standard, the SEP holder may gain significant market share which could result in abuse of dominance. This article aims to address two main issues, i.e., how do various jurisdictions especially the US, EU and India regulate abuse of dominance in SEP licensing in accordance with their own competition laws and what analytical and evidentiary approaches can be used to ascertain 'relevant market' and 'dominance' in SEP disputes particularly in the Indian context. The methodology adopted is a comparative legal analysis which examines how SEP issues are handled in the US, EU and India using doctrinal and case law-based approach. The article examines how crucial SEP issues including Non-Disclosure Agreements (NDAs) and royalty base calculations have been addressed by competition authorities, especially the Competition Commission of India (CCI). It also assesses the applicability of an effect-based approach in contrast to the conventional form-based approach in determining market power in IP-related antitrust cases. Finally, this article proposes uniform legal strategies and policy recommendations in order to guarantee FRAND compliance worldwide while safeguarding against anti-competitive conduct. This article promotes the wider goal of striking a balance between innovation incentives and fair market access by addressing unresolved challenges in SEP enforcement, especially in India.

KEYWORDS: Standard Essential Patents, FRAND, Abuse of Dominance, Globalisation

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INTRODUCTION

The increasing integration of digital technologies into industrial, communication and consumer sectors has led to a significant expansion in the creation and adoption of global technology standards. Modern-day communication networks like 5G, local wireless protocols such as WiFi and ubiquitous technologies like USB interfaces are all anchored in standardized protocols.¹³⁴ These protocols ensure compatibility, interoperability and network effects across markets and borders. Crucially, many components of these standards are protected by patents that are deemed essential to compliance termed as ‘Standard Essential Patents’ (SEPs). A SEP is a patent that cannot be circumvented if one wishes to manufacture a product that conforms to a particular standard.¹³⁵

The strategic value of SEPs lies in their indispensability. A firm that owns SEPs holds a de facto monopoly over a segment of the technology ecosystem. While patent law is designed to incentivize innovation by granting temporary exclusivity, the uniqueness of SEPs lies in the standardization process itself, which compels other market participants to rely on the patented technology.¹³⁶ This creates the potential for a powerful market position that if unchecked may be leveraged to extract excessive royalties or impose discriminatory licensing conditions.

To mitigate the risk of violation, most Standard-setting Organizations (SSOs), such as the European Telecommunications Standards Institute (ETSI) and the Institute of Electrical and Electronics Engineers (IEEE), require SEP holders to commit to licensing their technologies on Fair, Reasonable and Non-Discriminatory (FRAND) terms.¹³⁷ The FRAND commitment is designed to preserve the openness and inclusivity of standardized technologies, while ensuring that innovators are fairly compensated. However, the absence of universally accepted definitions for ‘fair,’ ‘reasonable’ and ‘non-discriminatory’ has led to inconsistent interpretations and enforcement across jurisdictions.

This friction between the exclusive rights of SEP holders and the access rights of implementers presents a fertile ground for legal contestation. On one hand, SEP holders seek returns on their

¹³⁴ Michael A Carrier, ‘A Roadmap to the Smartphone Patent Wars and FRAND Licensing’, (2012) 2 CPI Antitrust Chronicle.

¹³⁵ Rupprecht Podszun, ‘Standard Essential Patents and Antitrust Law in the Age of Standardisation and the Internet of Things: Shifting Paradigms’, (2019) 50 IIC 720.

¹³⁶ *Ibid.*

¹³⁷ Richard T Rapp and Lauren J Stiroh, *Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy*, Joint Hearings of the US Department of Justice and the Federal Trade Commission (Washington DC, 18 April 2002).



investments in research and development whereas on the other, implementers demand access to foundational technologies at affordable and non-discriminatory rates. This results in a complex interaction between intellectual property law and competition law, particularly in the context of allegations of abuse of dominance.

The core research question of this paper is that how do different legal systems balance the rights of SEP holders with the obligation to prevent anti-competitive conduct that may distort access to standardized markets. In answering this, the paper undertakes a comparative and empirical legal analysis, focusing on three major jurisdictions, i.e., India, the European Union and the United States, each with differing approaches to competition law and intellectual property enforcement.

From an economic standpoint, the SEP ecosystem is marked by several anomalies. Unlike traditional markets where substitutes often exist, the holder of a SEP faces no practical competition once a standard is adopted. Additionally, the vertically integrated nature of tech firms and the proliferation of cross-licensing arrangements complicate royalty negotiations. In such an environment, competition regulators have a vital role in addressing potential abuses such as royalty stacking,¹³⁸ refusal to license, or injunctions used as leverage which could deter innovation and stifle market entry.

The FRAND obligation, though widely endorsed, lacks clear legal standards. Courts and competition authorities have often adopted divergent approaches in assessing whether a given royalty rate is ‘reasonable,’ or whether a licensing refusal constitutes ‘abuse.’¹³⁹ For instance, while some jurisdictions treat FRAND as a contractual commitment enforceable under civil law, others interpret it through the lens of market dominance and abuse under competition law.

This diversity in legal reasoning has translated into growing cross-border litigation. SEP holders often engage in forum shopping¹⁴⁰, choosing jurisdictions with favorable injunction standards or royalty valuation precedents. Conversely, implementers may initiate anti-suit injunctions to block enforcement proceedings in foreign jurisdictions. This proliferation of SEP-related litigation has had tangible impacts on both innovation and international trade.

¹³⁸ Mark A Lemley and Carl Shapiro, ‘Patent Holdup and Royalty Stacking’, (2007) 85 Texas L Rev 1991.

¹³⁹ Doris Johnson Hines and Ming Tao-Yang, ‘Worldwide Activities on Licensing Issues Relating to Standard Essential Patents’, https://www.wipo.int/wipo_magazine/en/2019/01/article_0003.html (last visited 10-08-2025).

¹⁴⁰ Merriam-Webster, ‘Forum Shopping’, <https://www.merriam-webster.com/legal/forum%20shopping> (last visited 10-08-2025).



The policy stakes are considerable. On one hand, weak enforcement of FRAND may embolden SEP holders to extract unreasonable royalties, causing a patent hold-up scenario.¹⁴¹ On the other hand, overly stringent competition law scrutiny may dilute the value of SEPs, reducing incentives to participate in standards development and invest in R&D. The balance between *access and reward; exclusivity and openness; and monopoly and competition* lies at the core of the global SEP dilemma.

This paper, grounded in doctrinal review and supported by litigation trends and empirical illustrations, aims to navigate this policy and legal maze. It is structured as follows: Section I outlines the concept of SEPs, their market implications and the rationale behind FRAND commitments. Sections II to Section IV provide a jurisdiction-wise analysis of SEP enforcement in India, the EU and the US, drawing on leading case law and regulatory pronouncements. Section V presents comparative insights on areas of convergence and divergence across jurisdictions and Section VI concludes with reform suggestions aimed at achieving a fair and competitive global SEP ecosystem. With offering a comparative legal perspective, this paper contributes to the growing literature that seeks to harmonize SEP enforcement practices and ensure that innovation and competition continue to flourish in the age of digital convergence.

SEPS, MARKET POWER AND THE ROLE OF COMPETITION LAW

SEPs confer significant market power. Their mandatory use within a technical standard makes them immune to substitution. This absence of competition at the technological level distinguishes SEPs from ordinary patents. The standardization process effectively magnifies the exclusivity provided by patent law by making the patented technology indispensable for market participation. Consequently, the holder of a SEP occupies a position of dominance, not only economic but also structural and regulatory.¹⁴² To prevent such dominance from becoming abusive, competition authorities have emphasized the importance of licensing SEPs on FRAND terms.¹⁴³ However, what constitutes ‘fair,’ ‘reasonable,’ or ‘non-discriminatory’ has often been left to judicial discretion. The core issues generally revolve around whether the royalty rate demanded is excessive or discriminatory; whether the SEP holder has refused to license or imposed unfair terms; and whether injunctions are used coercively to

¹⁴¹ Damien Geradin and Miguel Rato, ‘Can Standard-Setting Lead to Exploitative Abuse? A Dissonant View on Patent Hold-up, Royalty-Stacking and the Meaning of FRAND’ (2007) 3 European Competition LJ 101.

¹⁴² Communication from the Commission, *Guidance on the Commission’s Enforcement Priorities in Applying Article 82 of the EC Treaty to Abusive Exclusionary Conduct by Dominant Undertakings* (2009) OJ C45/7.

¹⁴³ *Id.* at 95.



extract supra-FRAND royalties. Competition law, particularly provisions concerning abuse of dominance (Article 102 TFEU in the EU; Section 4 of the Indian Competition Act, 2002; and Section 2 of the Sherman Act in the US) becomes relevant when SEP holders exploit their unique position to distort the market. These laws aim not to punish dominance per se, but its abusive exercise.

The central concern is the so-called ‘patent hold-up’, i.e., a situation where after the standard is adopted and implementers are locked in, the SEP holder leverages their indispensability to demand unfair terms.¹⁴⁴ A related problem is ‘royalty stacking’, where implementers must license multiple SEPs from different holders, each of whom charges royalties that cumulatively exceed competitive levels. A empirical review of litigation data below reveals a consistent increase in disputes involving SEPs, with courts and regulatory bodies acting as key venues for balancing IP rights with market fairness:

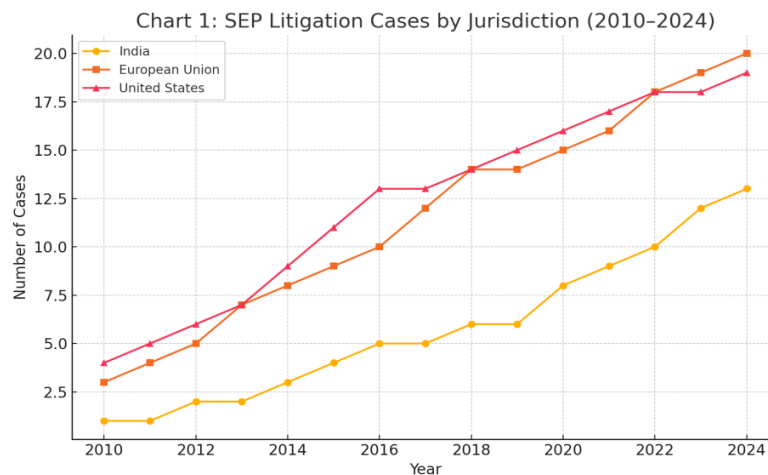


Chart 1: SEP Litigation Cases by Jurisdiction (2010–2024)

The chart below illustrates the frequency of key legal issues in global SEP disputes between 2010 and 2024. Royalty calculation and injunctions dominate the landscape, reflecting persistent controversies over how much should be paid and when enforcement should occur. Meanwhile, FRAND disputes and NDAs also feature prominently, highlighting ongoing tensions around fair licensing practices and confidentiality in SEP negotiations, while market definition emerges as a less common but still relevant area of contention.

¹⁴⁴ *Id.* at 97.



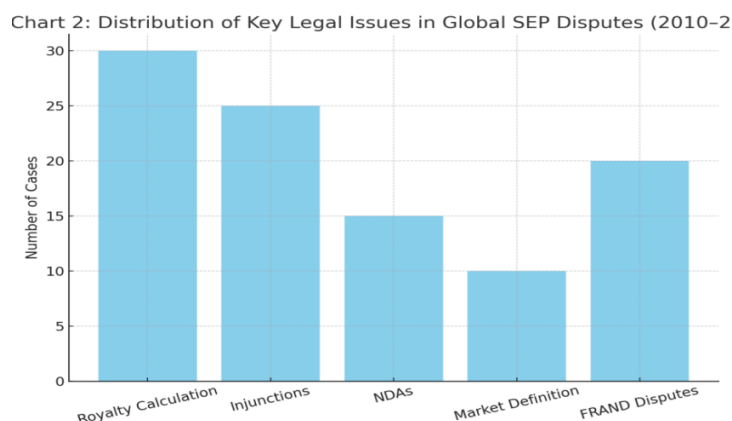


Chart 2: Distribution of Key Legal Issues in Global SEP Disputes (2010–2024)

In this regulatory context, competition law plays both a corrective and a preventive role. It corrects market distortions caused by SEP abuse and prevents monopolization in technology markets that thrive on interoperability. The next sections explore how this balance has been pursued in India, the EU and US.

INDIA'S APPROACH TO SEPS BETWEEN REGULATORY GAPS AND JUDICIAL CAUTION

India presents a compelling yet complex regulatory landscape for SEPs. The country's burgeoning digital and telecommunications sectors have seen a rise in SEP litigation, but India lacks a dedicated statutory framework that explicitly addresses FRAND obligations or defines SEP-specific conduct under its competition regime. The burden of interpretation has thus fallen largely upon the Competition Commission of India (CCI) and the judiciary resulting in a fragmented legal narrative.

At the heart of India's SEP jurisprudence lie the high-profile disputes between Swedish telecom giant Ericsson and Indian handset manufacturers such as Micromax, Intex and iBall. These cases served as the first real battlegrounds for interpreting SEP licensing practices through the lens of competition law. In *Micromax Informatics Ltd. v. Telefonaktiebolaget LM Ericsson*¹⁴⁵ and *Intex Technologies v. Ericsson*¹⁴⁶, the CCI investigated Ericsson for imposing unfair and discriminatory royalty rates. Specifically, it was alleged that Ericsson calculated royalties based on the entire cost of the end product (mobile phones), rather than the Smallest Saleable Patent-Practicing Unit (SSPPU), a practice that could inflate royalty

¹⁴⁵ *Micromax Informatics Ltd v Telefonaktiebolaget LM Ericsson* AIR 2019 Del 2502.

¹⁴⁶ *Intex Technologies (India) Ltd v Telefonaktiebolaget LM Ericsson* CCI Case No 76/2013, 16 January 2014.



burdens disproportionately. The CCI, invoking Section 4 of the Competition Act, 2002, found that such royalty calculation methods combined with the imposition of Non-Disclosure Agreements (NDAs) could amount to abuse of dominance.

However, the progress made by the CCI in these investigations was significantly diluted by a later ruling of the Delhi High Court in *Telefonaktiebolaget LM Ericsson v. CCI & Anr*¹⁴⁷. In this decision, the court held that matters relating to patent licensing disputes, including alleged abuses under FRAND commitments, fell within the exclusive jurisdiction of the Patents Act, 1970. According to the court, the availability of remedies such as compulsory licensing under the Patents Act necessitated the need for competition law intervention. This decision created a jurisdictional deadlock, as the CCI was effectively barred from examining conduct that falls within the domain of competitive abuse. This judicial compliance to patent rights over competition concerns has led to a policy vacuum. In *Ericsson v. iBall*¹⁴⁸, the court upheld interim injunctions and portfolio licensing practices despite unresolved FRAND negotiations, suggesting a preference for safeguarding patent rights rather than scrutinizing them for abuse. Further, the judiciary has often accepted Ericsson's reliance on the Entire Market Value Rule (EMVR) without sufficiently interrogating its competitive implications. These rulings collectively point to a formalistic approach, where statutory protections under the Patents Act override economic analysis grounded in competition law.

Despite irregular acknowledgments in policy documents such as the Draft National IPR Policy (2016) and various consultations by the Department for Promotion of Industry and Internal Trade (DPIIT), India has made little legislative progress in harmonizing its SEP enforcement.¹⁴⁹ The absence of detailed guidance for determining FRAND compliance or balancing rights under the Competition Act and the Patents Act continues to generate uncertainty. Indian MSMEs and local manufacturers are left navigating a fragmented and often inaccessible legal terrain. Moreover, India's approach lacks the procedural clarity found in more mature jurisdictions. There are no formal guidelines for SEP licensing negotiations, nor any mechanism for neutral third-party valuation. The judicial emphasis on injunctions and the absence of alternative dispute resolution frameworks worsens delays and litigation

¹⁴⁷ *Telefonaktiebolaget LM Ericsson v Competition Commission of India* WPC 464/2014 (Del HC, 13 July 2023).

¹⁴⁸ *Telefonaktiebolaget LM Ericsson v Best IT World (India) Pvt Ltd (iBall)* CS(OS) No 2501/2015 (Del HC, 2 September 2015).

¹⁴⁹ *National Intellectual Property Rights Policy 2016: An Analysis*, <https://www.swaniti.com/wp-content/uploads/2022/10/National-IPR-Policy-2016-An-Analysis.pdf> (last visited 11-08-2025).



costs. As a result, SEP holders can leverage interim relief as a tool to pressurize implementers into accepting unfavorable terms.

Recent discussions within Indian legal academia and policy circles have called for the codification of FRAND principles into national law. Proposals include establishing specialized Intellectual Property Appellate Boards (IPABs) or designating technical benches within High Courts to handle complex SEP disputes. There is also growing advocacy for greater alignment between the CCI and patent offices to ensure consistent treatment of SEPs under both competition and IP law. In the absence of such reform, India's SEP landscape remains governed by fragmented oversight, judicial reluctance and limited regulatory coordination. This risks discouraging participation in standard-setting activities and undermines India's goal of becoming a global hub for technology manufacturing and innovation.

THE EU'S THOUGHTFUL TAKE ON SEP ENFORCEMENT

The EU represents one of the most structured and doctrinally mature jurisdictions when it comes to regulating SEPs and enforcing FRAND commitments through the lens of competition law. The region's sophisticated legal apparatus particularly the jurisprudence of the Court of Justice of the European Union (CJEU) and the European Commission's Directorate-General for Competition has developed a nuanced framework that balances the monopolistic nature of SEPs with market fairness and access.¹⁵⁰ A cornerstone of the EU's approach is the landmark judgment in *Huawei Technologies Co. Ltd. v. ZTE Corp.*,¹⁵¹. This case addressed the critical issue of when SEP holder's pursuit of injunctive relief constitutes abuse of a dominant position under Article 102 of the Treaty on the Functioning of the European Union (TFEU). The CJEU ruled that a SEP holder violates Article 102 if they seek injunctions without first making a clear and specific licensing offer on FRAND terms and without allowing the implementer a fair opportunity to respond.

The Court outlined a structured negotiation protocol:

- a) The SEP holder must notify the alleged infringer, specifying the SEP and the nature of infringement.
- b) The SEP holder must make a written FRAND offer.
- c) The alleged infringer must diligently respond, either by accepting or by making a counter-offer.

¹⁵⁰ Communication from the Commission to the Institutions, *Setting Out the EU Approach to Standard Essential Patents*, <https://ec.europa.eu/docsroom/documents/26583> (last visited 12-08-2025).

¹⁵¹ *Huawei Technologies Co Ltd v ZTE Corp* (C-170/13) EU:C:2015:477.



- d) If negotiations fail, parties are encouraged to seek adjudication or third-party resolution, and only then an injunction be sought in good faith.

This framework, often referred to as the *Huawei v. ZTE protocol*, has since been endorsed by national courts across the EU and serves as a practical benchmark for assessing SEP conduct. It introduces procedural safeguards that prevent SEP holders from using injunctions as a strategic threat rather than a legitimate enforcement tool.

The decision has had a significant harmonizing effect. In *Unwired Planet International Ltd. v. Huawei Technologies (UK) Co. Ltd.*¹⁵², the UK Supreme Court upheld the ability of national courts to determine global FRAND rates and emphasized that refusing to take a global license could be viewed as a breach of FRAND obligations. Though the UK is no longer an EU member state, its jurisprudence continues to influence continental interpretations. At the administrative level, the European Commission has reinforced this judicial framework through competition investigations. In the *Samsung Electronics* case¹⁵³, Samsung was found to have abused its dominant position by seeking injunctions against Apple despite being bound by FRAND commitments. Similarly, in the *Google/Motorola Mobility* case¹⁵⁴, the Commission held that Motorola's actions seeking injunctions while refusing to license under FRAND constituted exclusionary abuse. The EU approach also places a strong emphasis on transparency and predictability in SEP licensing. Regulatory bodies encourage SSOs to adopt disclosure practices, require early declarations of essential patents, and implement mechanisms such as royalty caps, licensing databases and dispute resolution forums.¹⁵⁵ These measures aim to mitigate information asymmetries and reduce transactional friction.

Moreover, the EU promotes the use of objective benchmarks such as comparable licenses and market valuations to assess the fairness and reasonableness of royalty demands. This effects-based methodology aligns closely with the economic analysis traditionally employed in EU competition law and ensures that licensing behavior is scrutinized not just for formal compliance but also for substantive market impact. Another distinguishing feature of the EU system is the coherent

¹⁵² *Unwired Planet International Ltd v Huawei Technologies (UK) Co Ltd* (2020) UKSC 37.

¹⁵³ Commission Decision, Case AT.39939, *Samsung – Enforcement of Standard Essential Patents* (29 April 2014).

¹⁵⁴ Commission Decision, Case AT.39985, *Motorola – Enforcement of Standard Essential Patents* (2014) OJ C344/6.

¹⁵⁵ Pierre Regibeau, Raphael De Coninck and Hans Zenger, *Transparency, Predictability, and Efficiency of SSO-Based Standardization and SEP Licensing* (Report for the European Commission, 2016), https://ec.europa.eu/growth/content/study-transparency-predictabilityand-efficiency-ssobased-standardization-and-sep-0_en (last visited 13-08-2025).



integration between competition policy and innovation objectives. The European Commission's 2023 guidelines on horizontal cooperation agreements reaffirm the importance of preserving access to standardized technology.¹⁵⁶ The guidelines also caution against practices that may deter standard adoption or restrict downstream innovation.

Despite these advancements, the EU regime is not without its challenges. Critics argue that the burden of compliance has shifted heavily onto SEP holders, potentially discouraging participation in SSOs. Others note that differences in national implementation even within the EU may lead to forum shopping or inconsistent litigation outcomes. Nevertheless, the EU remains the global front-runner in codifying a procedural balanced and economically sound approach to SEP regulation. As technology markets become more intertwined and standards evolve at an accelerated pace, the EU's model offers a compelling blueprint for jurisdictions seeking to balance proprietary rights with public access. Its emphasis on procedural integrity, transparency, and judicial oversight ensures that competition law acts as a safeguard not a deterrent to innovation.

US APPROACH TO SEPS: FOCUS ON CONTRACTS AND LIMITED ANTITRUST REACH

The regulatory approach of the US to SEPs reflects a sharp contrast to that of the EU. US jurisprudence is characterized by its primary reliance *on contract law and patent law*, with limited intervention under *antitrust statutes*, particularly when it comes to the interpretation and enforcement of FRAND commitments. Although the US legal system recognizes the importance of SEPs within innovation ecosystems, its courts and enforcement agencies have generally exhibited a restrained posture in deploying antitrust tools to regulate SEP behavior. A foundational case in this realm is *Broadcom Corp. v. Qualcomm Inc.*,¹⁵⁷ the Third Circuit held that a patent holder's deception of a Standard Setting Organization (SSO) by making false FRAND commitments or failing to disclose patents may constitute exclusionary conduct under Section 2 of the Sherman Act. This ruling introduced the idea that bad faith within SSOs could distort competition and justify antitrust scrutiny. However, subsequent developments have narrowed the reach of this reasoning.

¹⁵⁶ Commission, *Guidelines on the Applicability of Article 101 TFEU to Horizontal Cooperation Agreements* (2011) OJ C11/1.

¹⁵⁷ *Broadcom Corp v Qualcomm Inc* 501 F.3d 297 (3d Cir 2007).



The clearest example of this judicial retreat can be seen in *Federal Trade Commission v. Qualcomm Inc.*,¹⁵⁸. The case centered on Qualcomm's practice of 'no license, no chips,' which effectively required implementers to accept patent licenses at Qualcomm's terms in order to gain access to essential chipsets. The district court originally ruled that Qualcomm's licensing policies constituted an anti-competitive refusal to deal and violated FRAND obligations. However, the Ninth Circuit reversed the decision, holding that Qualcomm's conduct fell within the boundaries of traditional patent rights and did not violate antitrust laws. The court concluded that 'anti-competitive behavior' required a more direct nexus to consumer harm than Qualcomm's conduct demonstrated. This decision marked a significant turning point. It affirmed a general judicial hesitancy to equate violations of FRAND commitments with antitrust abuse, thus signaling a doctrinal preference for resolving SEP disputes through contract law and patent licensing litigation. Unlike the EU's *Huawei v. ZTE* protocol, there is no structured procedural framework in the US governing FRAND negotiations or the grant of injunctions.

Nevertheless, US courts have contributed substantially to defining the contours of reasonable royalty determination. In *Microsoft Corp. v. Motorola, Inc.*,¹⁵⁹ the court laid out a rigorous methodology for FRAND analysis considering comparable license agreements, importance of the patented technology to the standard, contribution of the patented technology to the product and the market context at the time of negotiation. This framework was reflected in *TCL Communication Technology Holdings Ltd. v. Telefonaktiebolaget LM Ericsson*,¹⁶⁰ where the court employed a detailed top-down valuation to estimate FRAND rates. These decisions reflect a strong reliance on economic modeling and judicial discretion in royalty determination, albeit within the boundaries of contract enforcement.

On the regulatory side, the policy landscape has been fragmented due to differing philosophies at the Federal Trade Commission (FTC) and the Department of Justice (DOJ). Historically, the FTC has been more aggressive in viewing unfair SEP licensing practices as anti-competitive. In contrast, the DOJ, particularly under its Antitrust Division during the Trump administration, advocated a more restrained approach, suggesting that SEP-related disputes should primarily be addressed through contractual remedies. Further confusion has arisen from shifting policy statements. The 2013 joint

¹⁵⁸ *FTC v Qualcomm Inc* 969 F.3d 974 (9th Cir 2020).

¹⁵⁹ *Microsoft Corp v Motorola Inc* 795 F.3d 1024 (9th Cir 2015).

¹⁶⁰ *TCL Communication Technology Holdings Ltd v Telefonaktiebolaget LM Ericsson* No SACV 14-341 JVS (DFMx) (CD Cal, 21 December 2017).



DOJ-PTO policy statement emphasized that injunctive relief should rarely be granted to SEP holders due to the risk of patent hold-up. However, the 2019 update from the DOJ backtracked on this, asserting that injunctive relief was a valid remedy for patent infringement even for SEPs. This move has created uncertainty for both implementers and SEP holders.

Importantly, US courts generally permit injunctions in SEP cases unless there is clear evidence that the SEP holder breached a contractual obligation to license on FRAND terms. The absence of a formal requirement to exhaust licensing discussions before seeking an injunction distinguishes the US from the EU and contributes to a more adversarial litigation climate. While this legal conservatism arguably supports innovation by preserving strong patent rights, critics argue that it enables strategic behavior by SEP holders and risks deterring competition. The heavy emphasis on private negotiation, absence of procedural mandates, and limited antitrust reach collectively makes the US system more permissive to SEP holders compared to its European counterpart. Nonetheless, the US remains influential in shaping global SEP norms, particularly due to the technical and commercial dominance of American firms in the telecommunications and semiconductor sectors. Its rich body of case law on FRAND valuation continues to serve as a global reference point for judicial approaches to complex licensing arrangements. The contrasting regulatory philosophies between US and EU approaches reveal the deeper ideological divergence. While the EU leans towards regulatory intervention to ensure competitive neutrality, the US favors contractual autonomy and market-driven solutions. The next section explores these differences through a comparative synthesis.

COMPARATIVE INSIGHTS: CONVERGENCE AND DIVERGENCE IN SEP REGULATION

A comparative analysis of the regulatory approaches to SEPs and FRAND enforcement across India, the EU, and the US reveals distinct legal philosophies, institutional priorities and levels of procedural maturity. However, amidst these differences, there are also emerging areas of convergence that may pave the way for harmonized global standards.¹⁶¹

The EU represents the most advanced jurisdiction in balancing intellectual property rights with competition law principles. Through landmark decisions such as *Huawei v. ZTE* and consistent enforcement actions by the European Commission (e.g., *Samsung*, *Motorola Mobility*), the EU has

¹⁶¹ Rupperecht Podszun, 'Standard Essential Patents and Antitrust Law in the Age of Standardisation and the Internet of Things: Shifting Paradigms' (2019) 50 IIC 720.



developed a procedural framework that prioritizes negotiation, transparency and economic effects-based analysis. The focus is not on punishing dominance but on ensuring that dominance is not exercised in an exclusionary or exploitative manner. Courts apply structured protocols for FRAND negotiations and closely scrutinize requests for injunctive relief, thereby safeguarding access to standardized markets.

In contrast, the US adopts a more hands-off approach, grounded in the doctrines of patent and contract law.¹⁶² Although foundational cases such as *Broadcom v. Qualcomm* and *Microsoft v. Motorola* introduced mechanisms for evaluating FRAND commitments, US courts have generally refrained from invoking antitrust law in SEP disputes. The reversal of the district court's decision in *FTC v. Qualcomm* illustrates the judiciary's reluctance to equate SEP licensing conduct with anti-competitive behavior under the Sherman Act. While the US system fosters innovation through strong protection of patent rights, it often leaves implementers with fewer regulatory safeguards against opportunistic SEP assertions.

India by comparison occupies a middle ground. The CCI has shown a willingness to investigate SEP holders under abuse of dominance provisions. However, judicial deference to patent law, particularly in the *Telefonaktiebolaget LM Ericsson v. CCI* decision, has severely curtailed the CCI's authority in such matters. Indian courts have tended to favor SEP holders in granting injunctions and have not developed a consistent methodology for FRAND valuation. The result is a fragmented and uncertain legal environment where implementers, especially domestic firms face higher costs and risks.

These divergences reflect deeper ideological tensions between regulatory intervention and market freedom. The EU leans toward safeguarding downstream innovation and market access through proactive competition enforcement. The US prioritizes upstream innovation and the sanctity of patent rights, relying on the assumption that private negotiation will yield efficient outcomes. India lacking clear statutory guidance or institutional coordination swings between these poles without a coherent national strategy.

Despite these differences, there is a growing international consensus on several key principles:

¹⁶² Damien Geradin, *SEP Licensing After Two Decades of Legal Wrangling: Some Issues Solved, Many Still to Address*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3547891 (last visited 7-08-2025).



- **Transparent Licensing Practices:** All jurisdictions recognize the importance of clear good-faith negotiations. Courts and regulators alike stress the need for early disclosure of licensing terms and essential patents.
- **Objective Royalty Benchmarks:** Courts in the US (e.g., *TCL v. Ericsson*), EU and India increasingly rely on comparable licenses, market conditions and economic modeling to determine reasonable royalties.
- **Limits on Injunctive Relief:** While the US remains more permissive, both EU and Indian regulatory bodies have acknowledged the potential for patent hold-up when SEP holders aggressively seek injunctions without negotiating in good faith.
- **Alternative Dispute Resolution (ADR):** All regions are gradually embracing arbitration and mediation to resolve SEP disputes more efficiently and avoid prolonged litigation.

This convergence suggests a potential pathway toward a *soft law framework*, perhaps under the auspices of the World Intellectual Property Organization (WIPO) or the World Trade Organization (WTO).¹⁶³ Such a framework could codify procedural obligations for SEP holders and implementers, define FRAND terms through illustrative benchmarks and recommend non-judicial dispute resolution mechanisms. It would not override domestic laws but would provide a harmonized reference point for courts, regulators and SSOs. A comparative takeaway is that the *absence of formal, legally binding definitions for FRAND terms* is the root cause of many global SEP disputes. As long as ambiguity persists, litigation will continue to flourish, creating uncertainty for technology developers and users alike. The need for legal certainty is especially pressing in high-growth digital economies where standards evolve rapidly and interoperability is crucial.

CONCLUSION

The rise of SEPs at the intersection of intellectual property law and competition policy presents one of the most pressing challenges for modern innovation economies. As technology standards increasingly underpin economic activity from telecommunications and Internet of Things (IoT) devices to Artificial Intelligence systems, the legal mechanisms governing SEP licensing must evolve to balance proprietary incentives with equitable market access. This paper has examined how India,

¹⁶³ Nataliia Kozachuk, 'Counteracting SEP Abuse: In Search of a WTO-Consistent Approach' (2019) 53 J World Trade 153.



the EU, and the US approach this balance, revealing both doctrinal divergence and emerging global convergence. In the EU, the commitment to procedural fairness, economic impact assessments and transparent negotiation protocols has positioned the region as a global leader in SEP regulation. The *Huawei v. ZTE* framework, reinforced by enforcement actions in *Samsung* and *Google/Motorola Mobility*, illustrates a sophisticated regime where competition law plays a central role in policing SEP-related market abuses. National courts and the European Commission work in tandem to ensure that FRAND commitments are meaningfully enforced. The US while influential in jurisprudence and innovation, has moved toward a more restrained interpretation of antitrust liability in SEP disputes. The *FTC v. Qualcomm* decision curtailed federal enforcement efforts, reaffirming that FRAND-related disputes are better addressed through contract principles unless exclusionary conduct is clearly established. Nevertheless, US courts have significantly contributed to shaping valuation methodologies, particularly through decisions in *Microsoft v. Motorola* and *TCL v. Ericsson*, which remain influential globally. In India, institutional fragmentation has hindered the development of a coherent SEP enforcement regime. The CCI has shown initiative in addressing exploitative licensing practices, but its jurisdictional authority has been constrained by judicial interpretations that prioritize the Patents Act over competition principles. The result is a policy vacuum where SEP holders operate with considerable discretion and implementers face legal uncertainty. Despite these differences, the comparative study reveals broad consensus on several principles necessary for the effective governance of SEPs like good-faith negotiations and licensing transparency, objective benchmarks for royalty determination, caution in granting injunctive relief absent bad faith and promotion of Alternative Dispute Resolution (ADR) to avoid litigation gridlocks.

To consolidate these gains and address persistent challenges, this paper proposes the following reform recommendations:

- a) ***Codification of FRAND standards international legislation:*** Countries should incorporate explicit definitions and procedural obligations for FRAND negotiations into their domestic legal frameworks. This would provide clarity for courts and contracting parties and minimize interpretive divergence.
- b) ***Creation of specialized SEP Tribunals:*** Establishing expert tribunals or designating specialized benches within existing courts would streamline adjudication and ensure technical competence in assessing licensing disputes.



- c) ***Mandatory Ex Ante disclosures by SEP holders:*** Standard Setting Organizations (SSOs) should mandate early disclosure of royalty expectations and licensing terms. This reduces information asymmetry and facilitates informed negotiation.
- d) ***Global licensing and litigation database:*** An open-access repository, ideally maintained by WIPO or WTO should track SEP declarations, licensing terms and case law outcomes. Such a tool would aid benchmarking, promote transparency and deter abusive conduct.
- e) ***Adoption of ADR mechanisms as first resort:*** Regulatory frameworks should prioritize arbitration or mediation before allowing injunctive litigation. This is especially vital for resource-constrained implementers such as small and medium enterprises (SMEs).
- f) ***Development of a soft law instrument:*** A WIPO-led initiative could articulate model guidelines on SEP licensing by drawing from best practices in the EU, US and other jurisdictions. While being non-binding such a soft law framework would harmonize global norms and assist domestic regulators.
- g) ***Periodic Economic Impact Assessments:*** Regulators should periodically evaluate the effects of SEP enforcement on innovation, market competition and consumer prices. These assessments would provide empirical grounding for policy updates.
- h) ***Capacity building and judicial training:*** Investing in judicial education and regulator training on SEP-related matters would enhance adjudicatory consistency and reduce case backlogs.

As digital ecosystems expand and technological interdependence deepens, the stakes of SEP enforcement will only rise. The future of equitable standardization lies not merely in legal doctrine but in the capacity of institutions to adapt, coordinate and innovate. With fostering international cooperation, procedural rigor and balanced enforcement, the global legal community can ensure that SEPs serve both the creators of technology and the broader public interest. This comparative legal study thus concludes that *balancing innovation and market power in the SEP ecosystem* requires a multilayered, harmonized approach anchored in clear legal standards, institutional coordination and global collaboration.



CHAPTER 07

THE DISAPPEARING CONSUMER: RETHINKING SEP ENFORCEMENT AND FRAND THROUGH A USER-CENTRIC LENS

- Aditi Bhardwaj*

ABSTRACT

The purpose of Standard Essential Patents (SEPs) is to encourage innovation and maintain universal access to essential technologies. But in reality, SEP disputes frequently escalate into high-stakes conflicts between big businesses implementers fighting irrational demands, and patent owners demanding royalties. The consumer, who is the target of competition law, is frequently disregarded in this legal battleground. This research argues that FRAND licensing practices and competition law enforcement have both progressively marginalised the public interest, turning what ought to be pro-consumer regulation into a battlefield for corporations. It compares how national courts and regulators handle SEP disputes in the US, UK, and India, rarely putting the consumer at the centre. It also takes into account how current frameworks might raise expenses, inhibit innovation, and limit access to essential technologies. The article examines how SEP disputes materially impact consumers and how much consumer welfare is taken into consideration by US, UK, and Indian legal and regulatory frameworks when enforcing SEP. It investigates the reasons behind the widespread exclusion of end users, public interest organizations, and smaller innovators from current licensing and policy discussions. The paper examines the increasing discrepancy between the professed objectives of fair competition and the actualities of SEP litigation, which frequently centers on disputes between big businesses, using a comparative and doctrinal lens. The wider social and economic effects of SEP licensing are not adequately represented by the current mechanisms, especially when it comes to affordability, access to innovation, and market participation. The fundamental argument advocates for a reorientation of SEP and competition law policy that actively considers public interest concerns, enhances regulatory transparency, and involves civil society and smaller market players in the debate. The promise of open, accessible innovation risks becoming a legal myth without such a shift.

KEYWORDS: SEPs, FRAND, Consumer, Rights, Innovation, competition law

INTRODUCTION

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The original concept behind Standard Essential Patents (SEPs) was to balance market access with technological progress. By requiring licensing on Fair, Reasonable, and Non-Discriminatory (FRAND) terms, the goal was to prevent the monopolisation of crucial technologies. However, in practice, the SEP system has mostly become a battleground for powerful patent holders and major implementers, with the consumer, who could benefit most from competition law, noticeably absent from the debate. This study argues that the public interest has been increasingly sidelined by the global SEP and FRAND enforcement environment, as seen in key jurisdictions such as the US, UK, and India. Formalist views of patent and competition law have gained prominence in legal doctrines, often overlooking the social, economic, and market access costs faced by consumers and small businesses. This change is best exemplified in the US by the Ninth Circuit's decision in *FTC v. Qualcomm*.¹⁶⁴ The court determined that aggressive SEP licensing practices did not amount to antitrust violations, even if they increased costs for downstream OEMs and consumers. This decision implicitly accepted that consumer harm is irrelevant as long as there is competition among large firms, prioritizing doctrinal clarity over equitable outcomes. According to Jorge Contreras, this ruling essentially turns antitrust law from a tool for public protection to a shield for corporate power.¹⁶⁵ This corporate-centric perspective is further illustrated by the *Unwired Planet v. Huawei*¹⁶⁶ ruling from the United Kingdom. Although the UK Supreme Court clarified global FRAND obligations, it did not seriously investigate how these global licenses impact small businesses' and consumers' access to markets and affordability. Even though SEP licensing controls access to technologies necessary for modern life, the decision reaffirmed the importance of contractual enforcement over fair market participation.

India brings a crucial perspective to this conversation as a new digital powerhouse. India is particularly susceptible to unfair SEP practices because it has one of the biggest mobile phone markets in the world and more than 800 million internet users.¹⁶⁷ Due to the lack of a formal legal framework, enforcement has been dispersed across the judicial and competition law systems.¹⁶⁸ Cases like *Ericsson v. Micromax* demonstrated the negative effects that non-disclosure agreements and opaque royalty

¹⁶⁴ *FTC v. Qualcomm Inc.*, 969 F.3d 974 (9th Cir. 2020).

¹⁶⁵ Jorge L. Contreras, *FRAND and Antitrust*, CORNELL L. REV. ONLINE (Sept. 15, 2020), <https://www.lawschool.cornell.edu/research/law-review/FRAND-and-Antitrust.cfm>.

¹⁶⁶ *Unwired Planet Int'l Ltd v. Huawei Techs. (UK) Co Ltd*, [2020] UKSC 37.

¹⁶⁷ U.S. Int'l Trade Admin., *India – Digital Economy*, Trade.gov (2024), <https://www.trade.gov/country-commercial-guides/india-digital-economy>.

¹⁶⁸ *Id.*



practices can have on domestic SMEs and consumers.¹⁶⁹ Judicial challenges that questioned the Competition Commission of India's jurisdiction prevented the agency from using antitrust scrutiny to stop SEP abuse, paralyzing the regulatory system.

Price-conscious customers, regional manufacturers, and small innovators are disproportionately impacted by this institutional and legal environment. The threat of injunctions, excessive royalty stacking, and opaque licensing make it difficult for SMEs to enter the market and drive up the cost of technology.¹⁷⁰ This undercuts India's Atmanirbhar Bharat initiative's objectives of self-reliance and digital inclusion. High licensing fees have been shown to dramatically increase device costs, postpone market entry, and restrict low-income users' access to necessary technologies.¹⁷¹ Additionally, civil society organisations and consumer groups are still mostly left out of SEP policymaking and standard-setting bodies. IAM Media and the UK Intellectual Property Office (UKIPO) have conducted surveys that reveal SMEs frequently feel excluded from SEP negotiations due to a lack of transparency and effective engagement support systems.

The promise of FRAND will remain a legal fiction, according to this paper, unless the SEP enforcement regime is radically redesigned to make consumer welfare, equitable access, and the public interest its main pillars.¹⁷² It promotes a consumer-centred strategy that includes stricter antitrust scrutiny of licensing practices, transparency requirements, and representation of the public interest in standard-setting.¹⁷³ This study presents a normative argument for redefining the global FRAND debate from the perspective of the consumer, who is most impacted but least heard, by following the doctrinal development and socioeconomic effects of SEP enforcement across three significant jurisdictions.

THE MYTH OF CONSUMER-CENTRIC REGULATION

¹⁶⁹ Competition Comm'n of India, In Re: Micromax Informatics Ltd. and Ericsson, Case No. 50/2013 (Mar. 12, 2013).

¹⁷⁰ RETO M. HILTY ET AL., TOWARDS FAIR AND BALANCED SEP LICENSING, Max Planck Institute for Innovation and Competition (2019),

https://www.ip.mpg.de/fileadmin/ipmpg/content/stellungnahmen/MPI_SEP_Licensing_PositionPaper_2019.pdf.

¹⁷¹ Raghavi Viswanath, Demystifying the Indian FRAND Regime: The Interplay of Competition and Intellectual Property, 21 *J. INTEL. PROP. RTS.* 89 (2016).

¹⁷² Shreya Sampathkumar & Enrico Bonadio, Mapping the Indian Case Law on Standard Essential Patents, SSRN (Apr. 2024), <https://ssrn.com/abstract=4838382>.

¹⁷³ IAM, UKIPO Survey Suggests SME Concerns in SEP Licensing Landscape, IAM-Media (Oct. 2022), <https://www.iam-media.com/article/ukipo-survey-suggests-sme-concerns-sep-licensing-landscape>.



SEPs were designed as legal tools to guarantee that modern communication technologies like Bluetooth, Wi-Fi, 4G, and 5G would continue to be widely available.¹⁷⁴ Patent holders whose technologies are deemed essential to a standard are required to license them on FRAND terms to prevent monopolistic control.¹⁷⁵ The implicit promise that consumers would gain from innovation, interoperability, and reasonably priced access to necessary technologies is at the core of this regime. Theoretically, FRAND licensing ensures that no single party can price or gatekeep essential technologies. FRAND was designed to encourage manufacturer competition, lower product costs, and increase consumer choice by enabling widespread adoption across markets.¹⁷⁶ But the reality is very different. Instead of serving as a public interest protection, FRAND has been appropriated and turned into a private battleground that is becoming increasingly detached from the average consumer it was designed to safeguard.¹⁷⁷ The legal battles between the multinational tech behemoths Apple, Samsung, Qualcomm, and Ericsson, which take place in courtrooms all over the world, now dominate the SEP landscape. Complex, multi-jurisdictional claims about royalty rates, injunctions, and patent validity are frequently at the centre of these court disputes. In these proceedings, smaller innovators, civil society, and consumers have little to no visibility or voice.¹⁷⁸

Furthermore, downstream innovation is stifled by these disputes. Small businesses, startups, and regional manufacturers who are most likely to develop reasonably priced, context-relevant solutions frequently lack the funds to obtain SEP licenses or to defend themselves against allegations of infringement. Customers lose out on choice, price diversity, and locally customised solutions when smaller innovators are forced out of the market.¹⁷⁹ This chapter highlights corporate hijacking and how consumers lose out. The SEP and FRAND ecosystem was founded on principles of fairness, openness, and access. However, in reality, it has become a closed loop of corporate litigation, largely insulated from the voices of ordinary users. Consumers, along with smaller innovators and civil

¹⁷⁴ IP Europe, What Is a Standard-Essential Patent?, IP EUROPE (2024), <https://ipeurope.org/policy/intellectual-property-fuels-european-competitiveness/what-is-a-standard-essential-patent/> (last visited July. 29, 2025).

¹⁷⁵ STAVROULA KARAPAPA & LUKE McDONAGH, *INTELLECTUAL PROPERTY LAW* 559 (1st ed. 2019).

¹⁷⁶ Richard J. Gilbert, *Deal or No Deal? Licensing Negotiations in Standard-Setting Organizations*, 77 ANTITRUST L.J. 855, 855–56 (2011).

¹⁷⁷ Bowman Heiden & Justus Baron, *The Economic Impact of Patent Holdout*, SSRN (July 8, 2023), <https://ssrn.com/abstract=4505268> (last visited Apr. 29, 2025).

¹⁷⁸ Joseph Farrell et al., *Standard Setting, Patents, and Hold-Up*, 74 ANTITRUST L.J. 603, 608 (2007).

¹⁷⁹ Nancy Gallini & Suzanne Scotchmer, *Intellectual Property: When Is It the Best Incentive System?*, in *INNOVATION POLICY AND THE ECONOMY*, VOL. 2, at 51, 51–78 (Adam B. Jaffe et al. eds., Nat'l Bureau of Econ. Res. 2002).



society, have been excluded from a narrative that was meant to serve them. Until enforcement and policy mechanisms re-centre the public interest, the consumer will remain a marginalised stakeholder in the era of standardised innovation.

SEPS AND FRAND: BUILT FOR THE PUBLIC, CAPTURED BY CORPORATIONS

The legal SEPs were created to balance accessibility and innovation. Any company that wants to implement a technical standard (such as 5G, Wi-Fi, or USB) must use the patented technology. This is known as a standard essential patent. SSOs mandate that SEP holders license their patents on FRAND terms in order to stop them from abusing their monopoly power. SEPs and FRAND were initially intended to be highly public-oriented. By reducing costs, boosting innovation, and guaranteeing access to standardized products, this system was intended to prevent monopolistic pricing, encourage interoperability, and encourage widespread market participation all of which would ultimately benefit the end user. FRAND obligations were created to preserve a "careful balance between rewarding innovation and ensuring competition," as Stavroula Karapapa and Luke McDonagh point out.¹⁸⁰ In reality, FRAND commitments have evolved into secret, largely unregulated private negotiations that are frequently used by powerful patent holders to demand exorbitant royalties. In contrast to consumers, small implementers, and public interest groups, who bear the ultimate consequences of licensing outcomes, SEP holders often large multinational corporations have substantial influence over SSOs and licensing practices. Various problems have caused this conundrum.

No definition of FRAND

The promise of equality is at the core of FRAND. It is nearly impossible to determine whether SEP holders are discriminating against licensees by giving big businesses sweetheart deals while overburdening smaller ones in the absence of institutional or even public scrutiny. This undermines confidence in the licensing process and raises questions about the fundamental principle of nondiscrimination.¹⁸¹ Unfortunately, SSOs have not defined what FRAND means, leaving its

¹⁸⁰ STAVROULA KARAPAPA & LUKE MCDONAGH, *INTELLECTUAL PROPERTY LAW* 559 (1st ed. 2019).

¹⁸¹ Christopher Vendome, Mario Linares-Vasquez, Gabriele Bavota, Massimiliano Di Penta, Daniel German, Denys Poshyvanyk, "License Usage and Changes: A Large-Scale Study on GitHub" (2015) doi: 10.1109/ICPC.2015.32.



interpretation to courts and regulators.¹⁸² While there have been attempts to define FRAND in the literature on economics, the majority have concentrated on the "reasonable" principle. The term "non-discriminatory" has not been defined in the few discussions of the principle. Without a stronghold definition, the patent owner would have to license all newcomers, and rates would probably differ among licensees. At its core, this strategy involves denying access.¹⁸³ Accordingly, where there is a denial of access, all the price point goes up. Which is ultimately paid by the consumer. Defining FRAND is essential as it will define what is essential to the consumer. It is important to exemplify whether FRAND is made for consumers or only lenience. Further, a device's compatibility with equipment from other vendors determines how much a customer gets out of owning it.¹⁸⁴ It is not just about the price point but also about the ownership the consumer gets.

Opaque Licensing Practices: The Hidden Costs of Secrecy

Even though, Standard standard-essential patents are the result of collective action (standards) and public privileges (patents), but the discussions and disagreements surrounding them are typically bilateral and private rather than collaborative and public.¹⁸⁵ There is still a chance of harm even though it is generally believed that the benefits of standard-setting and patent protection in fast-paced, high-tech settings exceed the risks to the market.¹⁸⁶ The FRAND landscape has created opportunities for abusive and anticompetitive behavior by SEP owners and SEP implementers, and many players in the telecommunications industry have been both at the same time. This is partly due to the unique nature of the global SEP market, information gaps, and uncertainty about best practices.¹⁸⁷ This leads to a market where consumers are the end product, and they are the most lost.¹⁸⁸

Regulatory Blind Spots

¹⁸² Standard Setting Organizations Can Help Solve the Standard Essential Patents Licensing Problem, ANTITRUST CHRON. (Competition Pol'y Int'l, Boston, Mass.), Mar. 2013.

¹⁸³ *Id.*

¹⁸⁴ *Id.*

¹⁸⁵ Barbara Lauriat, *Pay No Attention to the Comparable Behind the Curtain! The Harms of Opacity in Standard-Essential Patent Licensing*, 38 BERKELEY TECH. L.J. 463, 468 (2023).

¹⁸⁶ European Commission's Formal SEP Regulation Proposal Addressed Certain Issues and is Now Criticized by Both Net Licensors and Net Licensees of Standard-essential Patents, FOSS PATENT BLOG (Apr. 28, 2023), <http://www.fosspatents.com/2023/04/european-commissions-formal-sep.html>.

¹⁸⁷ Brian J. Helmers & Christian Love, *An Empirical Test of Patent Hold-Out Theory: Evidence from Litigation of Standard Essential Patents*, 3 INT'L J. OF INDUS. ORG. (forthcoming 2023), <https://ssrn.com/abstract=3950060>.

¹⁸⁸ MANVEEN SINGH, STANDARD-SETTING ORGANISATIONS' IPR POLICIES 51, 69 71; Mark A. Lemley & Timothy Simcoe, *How Essential are Standard-Essential Patents?* 104 CORNELL L. REV. 607, 620–628 (2019).



In addition to limiting peer comparison, confidential licensing makes it more difficult for regulators and competition authorities to identify instances of anti-competitive behaviour.¹⁸⁹ The absence of readily available licensing data frequently limits the ability of organisations like the European Commission or India's Competition Commission to look into possible abuses, such as royalty stacking, refusals to grant licenses, or discriminatory pricing. Strategic licensing practices that may seem to comply with FRAND obligations on the surface but distort market access and pricing are made possible by this oversight gap. Sometimes SEP holders discourage smaller players without actually denying access by making unreasonable or ambiguous demands, which is known as "constructive refusal to license." For instance, there are conflicting methods of calculation and variation even within jurisdictions, making it difficult to reach a clear consensus on the optimal approach for setting FRAND rates.¹⁹⁰ Confidential arbitration can worsen the situation by preventing procedural precedents from arising from collective experience in resolving such disputes; without transparency, the FRAND ecosystem finds it difficult to establish consensus and efficient procedures.¹⁹¹ One must keep in mind that standard setting and patent protection are both aberrations in the context of typical market behavior, even though transparency regarding pricing information and agreements may seem like an anomaly or even an anathema in the business world. Furthermore, because it calls for levels of transparency and oversight that would be unsuitable and possibly detrimental in other markets, the idea of industry standard setting involving patented technology further defies accepted market norms.

WHO IS MISSING FROM THE ROOM?

Even though the FRAND and SEP, which licensing regimes are supposedly designed to encourage equitable access to innovation, the vast majority of the parties involved in their negotiation and implementation are big corporations, who hold patents and implement them.¹⁹² Their goals are rarely in line with those of the general public. Consumer advocacy groups, civil society organizations, and small and medium-sized businesses (SMEs) are conspicuously missing from this regulatory arena.¹⁹³

¹⁸⁹ Kung-Chung Liu, *As a Matter of Standard for Asia and Beyond?*, in *SEPS, SSOS AND FRAND: ASIAN AND GLOBAL PERSPECTIVES ON FOSTERING INNOVATION IN INTERCONNECTIVITY 1* [4.3.3] (2019).

¹⁹⁰ Vikas Kathuria & Jessica C. Lai, *Royalty Rates and Non-Disclosure Agreements in SEP Licensing: Implications for Competition Law*, 40(6) *E.I.P.R.* 357, 362 (2018).

¹⁹¹ Maureen K. Ohlhausen, *The Elusive Role of Competition in the Standard-Setting Antitrust Debate*, 20 *STAN. TECH. L. REV.* 93, 121–22, 141–42 (2017).

¹⁹² *AM. BAR ASS'N, COMM. ON TECHNICAL STANDARDIZATION, A SECTION OF SCI. & TECH. L., STANDARDS DEV. PATENT POLICY MANUAL X–XI* (Jorge L. Contreras, ed., 2007).

¹⁹³ *CASSELL'S LATIN DICTIONARY* 426 (1959).



Consumer Groups and Civil Society: Silenced Stakeholders

Consumers are rarely represented in regulatory hearings involving SEP disputes or in standard-setting bodies, even though they are the ultimate beneficiaries (or victims) of how FRAND terms are negotiated and enforced. Inflated royalty rates, obstacles to accessing necessary technologies (such as smartphones or medical devices), and slowed innovation because of legal uncertainty all primarily affect these stakeholders. However, consumer viewpoints are frequently dismissed as impersonal and ignored in favour of corporate lobbying and economic modelling.¹⁹⁴

In the current FRAND landscape, small and medium-sized businesses are especially vulnerable because they frequently innovate at the margins or create products that rely on standardized technologies. They do not have the financial or legal means to engage in lengthy negotiations or litigation, in contrast to tech giants. Furthermore, SMEs encounter information asymmetries that make it nearly impossible to assess whether the licensing terms offered to them are comparable to what others are paying because FRAND terms are negotiated bilaterally and in confidence. SMEs are consequently forced to accept unfair terms under threat of legal action or priced out of innovation ecosystems. This effectively establishes a two-tiered innovation economy: one for systemically excluded under-resourced innovators and another for powerful incumbents who can play the SEP game.¹⁹⁵ Because parties are essentially working in the dark, a lack of transparency frequently results in disputes over whether licensing terms are FRAND. These disagreements often have a significant impact on the SEP licensing market for the relevant standard and can escalate into expensive and time-consuming litigation involving key stakeholders. By assisting parties in recognising and resolving potential problems early in the negotiation process, transparent practices reduce the likelihood of conflict.

SMEs: Locked Out by Design

While SMEs are not the main focus of the paper, they are worth a mention as the economy is an intertwined tree with every part affecting the other. Small and medium enterprises are a big part of the economy. In the current FRAND landscape, small and medium-sized businesses are especially

¹⁹⁴ UK Intellectual Property Office, *UKIPO Survey Suggests SME Concerns with SEP Licensing Landscape*, IAM-Media (Nov. 7, 2023).

<https://www.iam-media.com/hub/sepfrand-hub/2022/article/ukipo-survey-suggests-sme-concerns-sep-licensing-landscape?>

¹⁹⁵ CASSELL'S LATIN DICTIONARY 426 (1959).



vulnerable because they frequently innovate at the margins or create products that rely on standardised technologies.¹⁹⁶ They do not have the financial or legal means to engage in lengthy negotiations or litigation, in contrast to tech giants.¹⁹⁷ Furthermore, SMEs encounter information asymmetries that make it nearly impossible to assess whether the licensing terms offered to them are comparable to what others are paying because FRAND terms are negotiated bilaterally and in confidence.¹⁹⁸ SMEs are consequently forced to accept unfair terms under threat of legal action or priced out of innovation ecosystems.¹⁹⁹ This effectively establishes a two-tiered innovation economy: one for systemically excluded under-resourced innovators and another for powerful incumbents who can play the SEP game.²⁰⁰

The Broader Democratic Deficit

Fundamentally, the FRAND commitments used to govern Standard Essential Patents (SEPs) were intended to be a compromise: implementers and consequently, consumers would have widespread and reasonably priced access to necessary technologies, while patent holders would be fairly compensated. However, a glaring democratic deficit is revealed by SEP governance in practice. This ecosystem of exclusion is made possible by the lack of independent examination of licensing terms, public-interest mandates, or state-imposed transparency obligations. Regulators and courts implicitly support opaque private order over democratic governance when they do not require disclosure or stakeholder consultation. In a system where results are determined by economic power rather than accessibility or fairness, remaining silent amounts to complicity. Furthermore, without a baseline standard, pricing benchmarks, or a democratic process to decide what is fair or reasonable, the rhetoric of "reasonable" and "non-discriminatory" licensing is meaningless. Rather, monopolistic players' strategic litigation is increasingly shaping global technology access, and courts make decisions with little to no input from the public they ultimately impact.

¹⁹⁶ Joff Wild, *UKIPO Survey Suggests SME Concerns About SEP Licensing Landscape*, IAM (Nov. 8, 2022), <https://www.iam-media.com/hub/sepfrand-hub/2022/article/ukipo-survey-suggests-sme-concerns-sep-licensing-landscape>.

¹⁹⁷ Barbara Lauriat, *Systemic Opacity in SEP Licensing and Its Impact on SMEs*, 38 Berkeley Tech. L.J. 7 (2023).

¹⁹⁸ Kung-Chung Liu, *As a Matter of Standard for Asia and Beyond?*, in SEPS, SSOS AND FRAND: ASIAN AND GLOBAL PERSPECTIVES ON FOSTERING INNOVATION IN INTERCONNECTIVITY 1 [4.3.3] (2019)

¹⁹⁹ Vikas Kathuria & Jessica C. Lai, *Royalty Rates and Non-Disclosure Agreements in SEP Licensing: Implications for Competition Law*, 40(6) E.I.P.R. 357, 362 (2018).

²⁰⁰ Unified Patents, *Comments on the Joint ITA-NIST-USPTO Collaboration Initiative Regarding Standards*, Unified Patents (Nov. 7, 2023), <https://www.unifiedpatents.com/insights/2023/11/7/comments-on-the-joint-ita-nist-uspto-collaboration-initiative-regarding-standards>.



RECLAIMING THE PUBLIC IN A PRIVATISED FRAMEWORK

Built on the promise of innovation and equitable access, the SEP-FRAND framework now functions in a world that glaringly deviates from its original ideals. It has strengthened corporate dominance, legal opacity, and exclusion rather than empowering consumers. In the meantime, consumers, small business owners, and civil society, the very stakeholders these systems were intended to support, are denied a voice. This democracy deficit is structural, not incidental. The current system protects incumbents and maintains a market that prioritizes economic power over the general welfare by keeping licensing terms confidential and decisions within the parameters of corporate negotiations. The burden falls on consumers in the form of increased costs, fewer options, and postponed innovation, while SMEs find it difficult to play a game with opaque and unfair rules. This disparity is exacerbated by the absence of an inclusive, transparent, and legally binding definition of FRAND. In the absence of explicit guidelines, public supervision, or participatory governance, FRAND turns into a meaningless pledge that is frequently mentioned in rhetoric but infrequently implemented in a way that puts the user first.

The SEP-FRAND regime needs to be refocused on its initial goals of democratizing access to technology, guaranteeing equitable participation, and safeguarding the public interest in order to regain its legitimacy and usefulness. This calls for systemic change, including the institutional inclusion of consumer organizations, SMEs, and civil society in the licensing, enforcement, and policymaking processes in addition to clearer legal definitions and regulatory standards. In a legal framework that was, in theory, created for them, the consumer will continue to be the disappearing subject until that time.

COMPARATIVE FRAMEWORKS AND THE CONSUMER GAP

Although the way competition law and intellectual property rights intersect varies from one jurisdiction to another, a common pattern emerges when examining the interpretation of FRAND and Standard Essential Patent (SEP) commitments: the consumer is often overlooked even though they are expected to benefit from fair licensing. To assess how national courts and regulators address—or overlook—the public interest in SEP enforcement, this chapter compares the approaches taken by the US, UK, and India. Despite doctrinal differences, each jurisdiction shows a structural failure to prioritise consumer welfare in SEP policy and litigation.

United States: Consumer Harm as a Background Actor



SEP enforcement in the United States (US) occurs at the intersection of contractual duties, patent law, and antitrust law. The consumer has often been marginalised by judicial and regulatory actions that prioritise corporate discretion and strict enforcement of intellectual property rights, despite the promise that FRAND obligations should promote public welfare and consumer access.

The district court in *Federal Trade Commission v. Qualcomm*,²⁰¹ first determined that Qualcomm's exclusive supply agreements and "no license, no chips" policy created anticompetitive harm, which is thought to raise prices for manufacturers and, ultimately, end users.²⁰² In order to guarantee equitable access to chips and licensing, the court issued an injunction. The Ninth Circuit, however, went in the opposite direction, rejecting the idea that a license refusal is an antitrust violation and highlighting the fact that violations of FRAND commitments are subject to contract and patent law rather than the Sherman Act. The court reaffirmed the legitimacy of maximizing patent-based revenues, even if consumers pay the price through higher device prices, by framing Qualcomm's actions as "hypercompetitive" rather than anticompetitive.²⁰³ This judicial stance, which is best represented by the Ninth Circuit's ruling in *FTC v. Qualcomm Inc.*, is indicative of a larger doctrinal shift that places more weight on the formal limits of contract and antitrust law than on the actual experiences of consumers. Although the court recognized Qualcomm's aggressive licensing strategies, it ultimately found that these actions did not amount to an antitrust violation, thereby protecting SEP holders from scrutiny as long as their actions stayed within the technical parameters of contract and patent law.

The downstream effects on consumers are deprioritized in a number of ways by this strategy. First, it has a limited, competitor-centric perspective on harm, requiring plaintiffs to demonstrate direct harm to competitors rather than to final consumers. In the context of SEP licensing, where competitive trickle-down benefits are rarely possible due to closed-door negotiations, discriminatory pricing, and opaque royalty structures, the presumption that harm to firms' competition will inevitably result in harm to consumers is broken.²⁰⁴ Second, the goals of consumer welfare and competition law are successfully separated by this legal framework. Historically, the Sherman Act has been construed to protect innovation, affordability, and consumer choice. However, the courts run the risk of

²⁰¹ *FTC v. Qualcomm Inc.*, 969 F.3d 974, (9th Cir. 2020).

²⁰² *Id.* at 985–86

²⁰³ *Ibid.* at 986.

²⁰⁴ Ron Knox, Ninth Circuit Provides Qualcomm Resounding Reversal, *GLOB. COMPETITION REV.* (Aug. 11, 2020), <https://globalcompetitionreview.com/article/ninth-circuit-provides-qualcomm-resounding-reversal>.



undermining the protective role of antitrust law by reclassifying exploitative licensing practices as merely exercises of patent rights. Now, SEP owners can use exclusionary licensing tactics with little fear of regulatory opposition, even if they lead to increased costs, restricted access, and a smaller range of products.²⁰⁵ Third, the equity aspect of technology access is marginalized by this doctrinal position. These days, essential technologies such as smartphones, wireless networks, and Internet of Things devices are not extras; rather, they are necessary for democratic engagement, financial inclusion, health, and education. Ignoring accessibility and affordability as legal harms strengthens monopolistic control over innovation pipelines and increases digital inequality. Inflated royalty stacking and delayed access to new technologies disproportionately affect the most vulnerable users, who are found in low-income markets or emerging economies.²⁰⁶

Lastly, the global FRAND governance is impacted by this posture. By declining to acknowledge consumer harm as actionable under antitrust laws, U.S. courts establish precedents that have the potential to weaken more liberal or public-interest jurisdictions. Transparency, equity, and consumer protection are relegated to optional principles rather than binding legal requirements when SEP holders use U.S. rulings to defend aggressive licensing practices overseas.²⁰⁷ All things considered, this legal minimalism may maintain doctrinal purity, but at the expense of market equity, consumer protection, and public confidence in the justice of innovation ecosystems. Consumer impact must be reintroduced into legal and regulatory frameworks as a primary evaluative factor, not as a side issue, if FRAND is to continue to be a meaningful commitment rather than a rhetorical device.

United Kingdom: Legal Clarity, Consumer Ambiguity

With its seminal ruling in *Unwired Planet v. Huawei*,²⁰⁸ the UK has been instrumental in forming international FRAND jurisprudence. The consumer is still only a supporting character in the definition of FRAND obligations, despite the UK courts being arguably more proactive than their American

²⁰⁵ Michael A. Finnegan, *FTC v. Qualcomm: Hypercompetitive or Anticompetitive?*, MINDING YOUR BUS. (Dec. 4, 2020), <https://www.mindingyourbusinesslitigation.com/2020/12/ftc-v-qualcomm-hypercompetitive-or-anticompetitive>.

²⁰⁶ Jordan Ludwig, *Sharp Elbows and Profit-Maximizing Licensing Ruled Insufficient Evidence of Anticompetitive Conduct in FTC v. Qualcomm Inc.*, CAL. LAW. ASS'N (Oct. 1, 2020), <https://calawyers.org/antitrust-and-consumer-protection/sharp-elbows-and-profit-maximizing-licensing-ruled-insufficient-evidence-of-anticompetitive-conduct-in-ftc-v-qualcomm-inc>.

²⁰⁷ Trevor C. Hill, *What 9th Circ. Qualcomm Licensing Ruling Means for SEPs*, STERNE KESSLER (Aug. 20, 2020), <https://www.sternekessler.com/news-insights/publications/what-9th-circ-qualcomm-licensing-ruling-means-seps>.

²⁰⁸ *Unwired Planet Int'l Ltd v Huawei Techs. (UK) Co Ltd*, UKSC/2018/0214 (Sup. Ct. Sept. , 2020).



counterparts in this regard.²⁰⁹ The public interest, however, was reduced to an implied background rather than an active part of judicial reasoning because the case narrowly framed the dispute as one involving contracts and commercial obligations.²¹⁰ Although the Court acknowledged that SEPs relate to technologies that are vital to modern life, it did not assess the impact of global licensing on technology prices, SMEs' market entry, or consumers' access to innovation.²¹¹

Although the ruling brought uniformity to a disjointed international licensing landscape, it did so by reaffirming patent holders' contractual priority over affordability or the general welfare. A wider judicial trend in the UK is revealed by this doctrinal focus: decisions regarding intellectual property and competition law are frequently made in light of corporate actors' rights rather than the rights or welfare of the general public.²¹² Despite the fact that FRAND stands for "fair, reasonable, and non-discriminatory," these terms have not been operationalized by UK courts in relation to digital equity, innovation access, or consumer pricing. The legal test is not whether the license terms lead to fair market outcomes or affordable technology, but rather whether the licensor treated licensees in similar circumstances similarly. This is a reflection of the UK's institutional silence regarding SEP licensing transparency. In stark contrast to the Competition and Markets Authority's (CMA) more active role in other technology markets, there is no legislative or regulatory body tasked with ensuring that SEP licensing regimes provide value for the consumer, even though courts have decided significant cases involving SEP holders.²¹³

Given the background SEP licensing controls access to mobile devices, network infrastructure, and IoT technology the lack of consumer-oriented analysis in *Unwired Planet* is especially noticeable. However, the Supreme Court's ruling ignores: if international licensing creates obstacles to entry or burdens smaller market entrants. whether downstream prices are impacted by royalty stacking, if licensing models taken from more affluent jurisdictions disadvantage consumers in low-income

²⁰⁹ *Id.*

²¹⁰ Jorge L. Contreras, *Global Markets, Local Courts: The Limits of FRAND Dispute Resolution*, 20 J. INTEL. PROP. L. 1 (2020).

²¹¹ Dennis W. Carlton & Allan L. Shampine, *An Economic Interpretation of FRAND*, 9 J. COMPETITION L. & ECON. 531 (2013).

²¹² Ron Knox, *Ninth Circuit Provides Qualcomm Resounding Reversal*, GLOB. COMPETITION REV. (Aug. 11, 2020), <https://globalcompetitionreview.com/article/ninth-circuit-provides-qualcomm-resounding-reversal>.

²¹³ *Id.*



markets. This omission is democratic as well as doctrinal.²¹⁴ The UK legal framework falls short of the fundamental objective of competition law, which is to safeguard the welfare of consumers, by neglecting to include end users in its analysis. Rather, it implicitly embraces a market model in which influential parties bargain over technologies accessible to the general public without having to formally defend equity or openness to the general public.²¹⁵

India: An Emerging Jurisdiction with Structural Uncertainty

The population is becoming more and more reliant on mobile, wireless, and smart technologies, making it one of the biggest and fastest-growing digital markets in the world.²¹⁶ However, there is no official legal or policy framework in India that addresses Standard Essential Patents (SEPs) and FRAND licensing requirements.²¹⁷ A volatile legal environment where corporate dominance, judicial inconsistency, and regulatory ambiguity converge often to the detriment of local innovators and consumers has resulted from this disconnect.²¹⁸ SEP enforcement in India is not governed by a single law or policy. Because of this, the nation's courts and competition authorities have been forced to handle cases on an as-needed basis, depending on the Competition Act of 2002.²¹⁹ general contract law, and patent.²²⁰ Notably, foreign rightsholders, especially LM Ericsson,²²¹ have brought significant SEP litigation in India against Indian smartphone manufacturers, including Micromax, Intex, Lava, and iBall. In these cases, Ericsson claimed that its licenses complied with FRAND terms and requested injunctions and royalties based on its SEP portfolio. Conversely, Indian defendants argued that the royalty rates were opaque, discriminatory, and exorbitant. When considering SEP licensing from the perspectives of consumer harm and market fairness, the Competition Commission of India (CCI) has been more proactive than the courts. The CCI began looking into Ericsson after receiving complaints

²¹⁴ Michael A. Finnegan, *FTC v. Qualcomm: Hypercompetitive or Anticompetitive?*, MINDING YOUR BUS. (Dec. 4, 2020), <https://www.mindingyourbusinesslitigation.com/2020/12/ftc-v-qualcomm-hypercompetitive-or-anticompetitive>.

²¹⁵ *Id.*

²¹⁶ U.S. Int'l Trade Admin., *India—Digital Economy*, Trade.gov (2024), <https://www.trade.gov/country-commercial-guides/india-digital-economy>.

²¹⁷ Data Reporter, *Digital 2025: India*, DataReportal.com (Jan. 2025), <https://datareportal.com/reports/digital-2025-india>.

²¹⁸ India: SEPs and FRAND – Litigation, Policy and Latest Developments, GLOBAL COMPETITION REV. (2024), <https://globalcompetitionreview.com/hub/sepfrand-hub/2024/article/india-seps-and-frand-litigation-policy-and-latest-developments>.

²¹⁹ The Competition Act, No. 12 of 2003, India Code (2003).

²²⁰ Aditya Choudhury & Arushi Tewari, *Standard Essential Patents and the Indian Judiciary: A Fair Way Forward*, 14 INDIAN J. L. & TECH. 37 (2019).

²²¹ *Ericsson v. Micromax*, IA No. 6735/2014 in CS(OS) 442/2013 (Delhi HC).



from Indian manufacturers. The company was accused of violating Section 4 of the Competition Act (abuse of dominance)²²² by imposing "excessive and discriminatory" licensing fees and non-transparent NDA clauses. According to the CCI's initial findings, the royalty model used by Ericsson, which is based on the price of the finished product rather than the price of its components, could result in "royalty stacking" and exorbitant expenses.²²³ Transparent and competitive licensing is hampered by the imposition of non-negotiable NDAs. By increasing smartphone costs and stifling competition, these tactics may hurt consumers.²²⁴ But in the Delhi High Court, Ericsson contested the CCI's authority, claiming that the Patents Act—not the Competition Act is the only law that governs patent licensing.²²⁵ The Commission's ability to examine SEP licensing practices was essentially frozen when the Court granted a stay on the CCI's investigation. A chilling effect has resulted from this regulatory turf war. Indian courts have not taken up the task of defining FRAND from a public-interest perspective, and the CCI is still reluctant to pursue SEP investigations in the absence of a definitive jurisdictional ruling.

India's consumers, small businesses, and digital inclusion are all directly harmed by this disjointed regulatory environment. Impact on Pricing: SEP holders are able to charge royalty rates that are more suitable for high-income nations since there are no benchmarks for FRAND rates that are specific to India's economic situation.²²⁶ The bottom of the pyramid cannot afford digital devices because these costs are passed on to Indian consumers. SME Barriers: Indian hardware innovators and start-ups frequently lack the financial and legal resources necessary to bargain for ambiguous SEP licenses. They face crippling uncertainty and litigation risk in the absence of regulatory support or clear royalty frameworks, which would stifle domestic innovation. Innovation gaps are another issue with low-cost, economical technologies that are vital for India's diverse population.²²⁷ These technologies suffer when market entry is hindered by high licensing costs,²²⁸ which contradicts India's stated goals of a digital economy and Atmanirbhar Bharat (self-reliant India).²²⁹ Digital inequality and the exclusion of

²²² The Competition Act, No. 12 of 2003, India Code (2003) s. 4.

²²³ Supra note 214.

²²⁴ Dennis W. Carlton & Allan L. Shampine, *An Economic Interpretation of FRAND*, 9 J. COMPETITION L. & ECON. 531 (2013).

²²⁵ Id.

²²⁶ SHREYA SAMPATHKUMAR & ENRICO BONADIO, MAPPING THE INDIAN CASE LAW ON STANDARD ESSENTIAL PATENTS (Apr. 2024).

²²⁷ The Invisible Architects: SEPs in Tech Industries – An Indian Perspective, Einfole Blog (2023).

²²⁸ GlobalPatentFiling.com, Patent Law and Innovation in India's Semiconductor Industry (2025)

²²⁹ Empirical study on hold-up in India's ICT sector (2023).



consumers are worsened by the lack of price-sensitive FRAND enforcement.²³⁰ Every small increase in prices caused by royalty loading can lead to significant socio-economic consequences for the large majority of Indians who rely on entry-level smartphones for banking, healthcare, and education.

CONCLUSION

From its pro-consumer and innovation-friendly beginnings, the enforcement of Standard Essential Patents has become more and more divergent. This paper has demonstrated how corporate interests, judicial formalism, and opaque licensing practices have ensnared the SEP-FRAND framework, which was designed to guarantee open and equitable access to essential technologies. Because of this, consumers who were supposed to gain from uniformity and equitable access are frequently left out, especially in countries like the US, UK, and India. In these jurisdictions, the substantive objective of consumer welfare has been subordinated to doctrinal coherence and contract enforcement by courts and regulators. India's regulatory void, the strict formality in *Unwired Planet v. Huawei*, and the permissive antitrust approach used in *FTC v. Qualcomm* highlight a growing global disregard for affordability, transparency, and inclusion. As a result, the licensing environment raises prices, prevents SMEs from entering new markets, and keeps civil society out of policy discussions. The FRAND framework needs to change from a corporate-centered, closed-door system to one that actually reflects its declared ideals in order to get back on track. Clear regulations, legally binding transparency in licensing agreements, significant representation of consumer and public interest groups in standard-setting organizations, and competition enforcement that puts affordability and accessibility first are all necessary for this. In the absence of these changes, FRAND runs the risk of turning into a legal myth a phony defense of market dominance rather than a tool for fair innovation. In the end, reclaiming the SEP-FRAND ecosystem for innovators and consumers is crucial for promoting a globally inclusive digital economy and goes beyond simple fairness. Innovation will benefit society as a whole, not just those who can afford to litigate it, if patent and competition laws are in line with democratic ideals and developmental realities.



²³⁰ FRAND in India: The Delhi High Court's emerging jurisprudence, *J. OF INTELL. PROP. L. & PRAC.* (2021).



CHAPTER 08

PATENT TOOLS AND POOLING RULES: REIMAGINING PATENT POOLS FOR INNOVATION EQUITY

- Vaishnovi Santosh Pawar*

ABSTRACT

Patent pools are becoming strategically relevant in knowledge-based global economy, especially in the high technology sectors of telecommunication, biotechnology, artificial intelligence and green energy due to cumulative innovation and over-patenting creating access barriers. While patent pools can increase efficiency by minimising the redundant costs related to IP licensing, litigation, and interoperability particularly for firms or new innovators; traditional patent pools can have exclusionary governance, increased royalty revenues, and inadequate engagement with the global south, small and medium size enterprises (SMEs) and public research institution. The paper investigates the question on: How can patent pools be recalibrated, to ensure equitable access to innovation while still ensuring some level of protection to patent holders? Through this study, evidence indicated that there was a material inequality and inclusion gap in the current patent pools. Based upon this evidence, the study also found a model that was more inclusive, transparent and development-focused. The idea was to view patent pools as collaborative agents to managing IP in order to create equitable access to innovations. This paper adopts a comparative case study research design to examine different patent pools models globally and in India i.e. MPEG-LA, Medicines Patent Pool (MPP) and even medical drones and India's Open COVID Pledge, along with the differences in regulatory government contexts in the US, UK, EU and India; the differences in their governance structures, royalties conditions, the regulatory context regarding whether you would have anti-collusion or cartel behaviours and stakeholder engagement. Of significance was the findings that state created patent pools or patents licensed with tiered royalty payments or open licensing, with multi-stakeholder engagement civil society, academia and SMEs - experienced a greater success to produce equity in innovation; while corporate created patents, or pools, opaque royalties perpetuated existing form of inequity. Of additional significance, were the elements that created enabling mechanisms - royalty tracking through blockchain, FRAND+ type royalties, and pro-social technology credits.

KEYWORDS: Patent Pools, Collaborative Licensing, Antitrust Law, FRAND Licensing, Emerging economies

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INTRODUCTION

In a rapidly digitizing global economy, innovation is increasingly establishing itself as the backbone of development, competitiveness, and social welfare. However, the journey from invention to meaningful use is often thwarted by fragmented patent ownership, expensive licensing, and exclusionary mechanisms. This issue is particularly dire in the high-technology sector, like telecommunications, artificial intelligence (AI), biotechnology, and green energy, where innovation is cumulative, interdependent, and constrained in a “patent thicket”—a critical mass of overlapping intellectual property rights that encumber market entry or adoption, especially for small innovators, in developing economies²³¹. Patent pools collective licensing arrangements that use the collective licensing arrangements of multiple patent holders to coordinate the licensing of a set of patents offered a way forward from these complexities. Patent pools clarified rights, reduced transaction costs, and eased interoperability when successful, enabling access to critical technology, reducing the risk of litigation, and accelerating diffusion in 5G standards²³², MPEG formats, and even essential pharmaceuticals. But patent pools still lack innovation equity. The majority involve corporate actors, apply secretive processes, are framed without sufficient safeguards for inclusivity, and largely fail to fulfil antitrust and competition requirements. As a result, small inventors, universities, and innovators in the Global South are usually excluded from negotiations or what they could afford to license. Others lack the organizational capacity to take advantage of pooled intellectual property. The gap remains: while developed markets reap the benefits arising from a more streamlined innovation ecosystem, emerging economies linger outside of the value creation process.

According to Prof. Rochelle Dreyfuss of NYU Law states, “Patents are not only exclusionary features; if effectively shepherded, they are a form of governance which can function as bridges to innovation.” In this paper, we argue that patent pools can address this bridging innovation role by reimagining pools with an innovation equity perspective: incorporating collaborative licensing approaches, equitable governance structures, capacity-building processes and fair antitrust protections. This can provide a new innovation, equity-model that maintains an IP-owner's economic incentives while

²³¹ Author Unknown, *Patent Pooling: A Solution for Collaborative Innovation*, presented at the 2023 Int’l Conf. on Innovative Science, Eng’g & Tech. (ICISSET), <https://iciset.in/Paper2639.pdf>.

²³² Author Unknown, *Patent Pools in the Age of IoTs, 5G, and NextGen Video Codecs*, IIPLA Webinar (2021), https://www.lexisnexisip.com/wp-content/uploads/2023/11/IIPLA-2021-Patent-Pools-in-Age-of-IoTs-5G-and-NextGen-Video-Codecs_Webinar.pdf.



ensuring fair participation, sustainable technology transfer, and better innovation ecosystems in both developed and developing contexts.

CONCEPTUAL FOUNDATIONS OF PATENT POOLS

Definition, Benefits, Risks, and Rationale for Reimagining

Patent pools are joint licensing agreements in which a group of patent-holders agree to license a set of essential patents, to each other or others, as a licensed user under a single centralized administration body, which is usually a neutral entity. Patent pools are a joint licensing arrangement with historical roots in the *Sewing Machine Combination*²³³ of 1856 and a more recent trajectory represented by significant pools such as *MPEG-2*²³⁴ in 1997²³⁵. Pooling agreements now cover many fields ranging from consumer electronics to pharmaceuticals, automotive, *IoT (Internet of Things)*²³⁶, artificial intelligence, and green technologies²³⁷. The potential benefits of patent pools include: reducing transaction costs by exchanging multiple bilateral agreements for a single license; avoiding litigation; facilitating standardization and interoperability and accelerating product launches; facilitating collaborative R&D; and reducing problems associated with royalty stacking. However, there are still associated risks, such as antitrust issues, patent-holders “hold-up” or wait-for-ransom behaviour, inequitable distribution of royalties, governance weaknesses, and limited access for members from low-income developing countries. This potential, and associated limitations, have led to the necessity to reimagine patent pools for increasing both efficiencies and equitable access. Five structural issues drive this imperative:

1. **Transactional Costs and Patent Thickets** – where overlapping patents create sufficiently high administrative burdens and delays to market entry, especially for a small- and medium-sized enterprise (SME);

²³³ Sewing Machine Combination, *Wikipedia*, https://en.wikipedia.org/wiki/Sewing_Machine_Combination (last visited Aug. 8, 2025).

²³⁴ Mark A. Lemley, *Intellectual Property and Standard-Setting Organizations: A Business Review Letter*, Berkeley Center for Law & Technology (2002), https://www.law.berkeley.edu/files/MPEG2_Business_Review_Letter.pdf.

²³⁵ Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, NBER Working Paper No. 15061 (2009), <https://www.nber.org/papers/w15061>.

²³⁶ Author Unknown, *Patent Pool in the Automotive Industry*, 6 Int'l J.L. Mgmt. & Humanities 123 (2023), <https://ijlmh.com/paper/patent-pool-in-the-automotive-industry/>.

²³⁷ *What Is a Patent Pool in India?*, Ezylegal (Aug. 7, 2023), <https://www.ezylegal.in/blogs/what-is-a-patent-pool-in-india>.



2. ***Blocking Patents and Hold-Up Risks*** – whereby post-adoption essential patents create opportunities for rent extraction²³⁸, unless essentiality assessments and transparent royalty structures are in place;
3. ***Inequities in Inclusion and Access*** – where the governance and pricing competencies may provide advantages to incumbent innovators over smaller or emerging market innovators, and require fees commensurate to value created, staged royalties, and formal representation;
4. ***Antitrust Exposure*** – where poorly configured pools create opportunities for the collusion of parties, which will require appropriately independent monitoring, open and transparent licensing agreements, and protections against discrimination;
5. ***Technical and Capacity Gaps in Emerging Economies*** – where affordability is not enough for adoption without local manufacturing, technical training, and infrastructure.

Resolving these five fault lines requires new pools to think about combining efficiency gains by using inclusive governance; providing transparent royalty structures; building antitrust safe-guard mechanisms; and committing to capacity building as direct and connected to the areas of (1) - (5). Thus, moving toward obstacles of market consolidation to opportunities for global innovation equity.²³⁹

ANTITRUST BALANCING: ASSESSING THE INTERPLAY BETWEEN COMPETITION AND COLLABORATION

Patent pools occupy both a strategic and sensitive space straddling intellectual property rights and competition law. When they are structured in an appropriate manner, patent pools provide distinct public benefits streamlining licensing, lowering transaction costs, and speeding-up the distribution of critical technologies in sectors predominantly dependent on cumulative innovation. Nevertheless, poorly designed pools may, among other things, create collusion²⁴⁰, foreclose markets, and concentrate market power with leading firms, thereby reducing innovation, and diminishment of market fairness.

²³⁸ Ralph Neven, *Patent Pools and Their Role in Facilitating Access to Technology*, WIPO Doc. WIPO/IP/ECO/GE/2/13 (2012),

https://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ip_econ_ge_2_13/wipo_ip_econ_ge_2_13_neven.pdf.

²³⁹ Christopher A. Cotropia, *Patent Pools and Antitrust*, 27 Harv. J.L. & Tech. 421 (2014), <https://jolt.law.harvard.edu/assets/articlePDFs/v27/27HarvJLTech421.pdf>.

²⁴⁰ World Intellectual Property Organization, *Patent Pools: A Solution to the Problem of Access in Technology Licensing* (2012), https://www.wipo.int/export/sites/www/competition-policy/en/docs/patent_pools_report.pdf.



Thus, the challenge is to achieve a proper balance between collaborative efficiency and competitive integrity. Antitrust risks in patent pools generally arise through, fixed pricing or standardized royalties, market foreclosure (or aggregate exclusions) of small competitors or competitive technologies, abusive discriminatory licensing in the sense of poor or no access, and exclusionary governance, particularly exclusion of inventors from small business, academia, and the Global South. Courts also have suggested that pools that foreclose the practice of alternative technologies can constitute patent misuse, as evidenced in cases like *Princo Corp. v. International Trade Commission*, which is a good example of emphasizing compliance-oriented practices²⁴¹.

Regulatory approaches toward achieving balance among various legitimate interests differ in various jurisdictions. In the United States, for example, the *DOJ-FTC Antitrust Guidelines*²⁴² suggest that antitrust concerns cannot arise when patent pools are pro-competitive. The requirements are that it must be proven that the patents are essential, non-substitutable and that members retain discretion in separate licensing arrangements. The *European Union's Technology Transfer and Horizontal Cooperation Guidelines* emphasize non-exclusivity, transparency, and fair access²⁴³. *India's Competition Act, 2002*²⁴⁴ gives the Competition Commission of India authority to take steps against patent pools that "appreciably restrict competition", whereas it remains ambiguous whether pooled *FRAND royalty* models for standard-essential patents (SEPs) will be treated as anti-competitive, as seen in the case of *Ericsson v. Micromax*²⁴⁵. China aligns its patent pooling regulation with state-led industrial policy on *SEPs*²⁴⁶, while German law embeds economic principles supporting participatory governance of small or medium-sized businesses (SMEs).

To preserve pro-competitive benefits and minimize antitrust risks, several design principles which can be used in the formation of "safe harbor" agreement should be considered. The first is independent

²⁴¹ *Princo Corp. v. Int'l Trade Comm'n*, 616 F.3d 1318 (Fed. Cir. 2010).

²⁴² Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition, U.S. Fed. Trade Comm'n (Jan. 24, 2017), https://www.ftc.gov/system/files/documents/public_statements/1049793/ip_guidelines_2017.pdf.

²⁴³ Council Regulation (EU) No. 89/2014, 2014 O.J. (L 89) 3 (EU).

²⁴⁴ Akanksha, *The Investigation of India Patent Pooling and Interaction with Competition Laws*, 4 Int'l J. Adv. Legal Rsch. 1 (2023), <https://ijalr.in/volume-4-issue-1/the-investigation-of-india-patent-pooling-and-interaction-with-competition-laws-akanksha/>.

²⁴⁵ *Ericsson v. Micromax: A Kick-Start to SEP, FRAND & Antitrust Jurisprudence in India*, *Competition Law Blog* (Wolters Kluwer, May 30, 2023), <https://legalblogs.wolterskluwer.com/competition-blog/ericsson-v-micromax-a-kick-start-to-sep-frand-antitrust-jurisprudence-in-india/>.

²⁴⁶ *SAMR Releases Antitrust Guidelines for SEPs*, King & Wood Mallesons (July 14, 2023), <https://www.kwm.com/cn/en/insights/latest-thinking/samr-releases-antitrust-guidelines-for-seps.html>.



administration and third-party essentiality checks to guarantee the only patents which go poor include quality patents. The second is to have a FRAND-type, transparent licensing with rate schedules and rules for royalty allocation in a public format to deter implicit price coordination²⁴⁷. The third is requiring market-share guarantees, such as preventing a condition of required market entry for the related markets based on pool membership status and requiring either a "must license" commitment of patents or for any patents outside the defined pool. The fourth is impose significant transparency obligations, e.g. membership disclosure, disclosures on patent portfolios or royalty payment methodologies and how revenues are shared by members, and inappropriateness due to creative or social accountability. The fifth is constructive engagement with regulators by seeking comfort letters or conditional approvals with antitrust authorities prior to the launch of pools (particularly when the market is concentrated or cross-border). By embedding these principles in the pool governance framework, patent pools can be effectively operated as platforms for collaborative innovation and competitive fairness, rather than devices for controlling markets. Designing a patent pool that simultaneously incorporated access and collaboration without monopolistic practices requires them to only embed these principles in their governance work from the outset. Beyond mere compliance when forming pooled arrangements, pools should aim to prevent exclusionary practices, particularly in fast-moving innovative areas with relevant societal implications for innovation (e.g. AI, green technology and public health). Transparency, non-exclusivity, inclusive governance and enforceable FRAND type agreements are legally useful, but also serve as strategic institutional designs to build trust, encourage diversity in members and provide assurance that the pool remains a contributor to innovation and not a vehicle for market control²⁴⁸.

EQUITY-ORIENTED PATENT POOLING IMPERATIVES FOR ACTION

Policymakers have a critical role in transforming the governance structure and operation of patent pools to ensure that they can serve as mechanisms for technology diffusion and promoting societal welfare. Certain interventions can redirect pools toward broader developmental objectives as opposed to pure profit maximisation. One approach is the establishment of public–private thematic pools targeting socially important areas, such as renewable energy, digital health, agricultural innovation, and

²⁴⁷ Organisation for Economic Co-operation and Development, *Patent Pools and Standard Setting: Market and Competition Issues*, OECD Doc. No. DAF/COMP/WD(2019)35 (2019), <https://one.oecd.org/document/daf/comp/wd%282019%2935/en/pdf>.

²⁴⁸ World Intellectual Property Organization, *Patent Pools: A Solution to the Problem of Access in Technology Licensing* (2012), https://www.wipo.int/export/sites/www/competition-policy/en/docs/patent_pools_report.pdf.



educational technology, where elements of public funding and participation help institutionalise equity-based objectives into the pool's remit²⁴⁹. Governments can also create incentives for technology providers to share, including tax incentives, expedited regulatory approvals, and preferential procurement for licensees who license on open or equitable terms, especially in sectors associated with health, environment, and sustainable development. Regional cooperation networks, positioned as alliances of multiple jurisdictions under a multilateral cooperative framework, such as BRICS, ASEAN, SAARC²⁵⁰, and the African Union may also contribute to greater cross-border pooling negotiated arrangements, can support collective bargaining and harmonising licensing conditions and technology transfers across countries working to solve similar developmental challenges. For policymakers to embolden such remedial mass actions into the global patent pool ecosystem, and through policy imperatives commensurate with inclusive growth and sustainable technology transformation and collaborative innovation platforms.

INNOVATION PRACTICES FOR STAKEHOLDER ENGAGEMENT

While effective policy reform will help with the governance structure of an equitable patent pool, it still relies on the active engagement of innovators in the and includes technologists, start-ups, and research institutions. By fostering collaboration instead of exclusion through intellectual property strategies, the pace of technology diffusion can be accelerated, and the collective capacity to solve problems can be elevated. Open participation by letting stakeholders add their patents to a shared pool can facilitate collaborative research and define needs, while also reducing duplication and overlap in the process. Crowdsourced IP models use participatory platforms to establish common licensing arrangements and prioritize need and concern from different user communities. By employing digital tools for managing IP, (ex. blockchain to securely track rights, AI-enabled tools to create patent maps for strategic insights, and smart contracts to execute royalty payments) the level of transparency, trust, and efficiency of operations can be enhanced. By applying these four practices of innovation, patent

²⁴⁹ *Green Patent and Renewable Energy*, KSandK (Aug. 5, 2023), <https://ksandk.com/intellectual-property-rights/green-patent-renewable-energy/>.

²⁵⁰ *Important Regional Organizations and Blocs*, Civildaily (Aug. 8, 2025), <https://www.civildaily.com/important-regional-organizations-and-blocs>.



pools can shape themselves from being static, exclusive collections into inclusive dynamic ecosystems that can reinforce one another²⁵¹.

GOVERNANCE, REPRESENTATION, AND ACCOUNTABILITY PRINCIPLES FOR AN EQUITABLE PATENT POOL

An equitable patent pool must be designed to promote transparency, inclusivity, flexibility, and accountability. A multi-stakeholder governance board that includes SMEs, academic institutions, local innovators, civil society, and development organisations is capable of member/listener perspectives that underpin well-informed decisions that are necessarily representative of the collective aspirations of users rather than a dominant sectoral perspective. Disclosures around inclusive pools include patents, terms of licenses, how royalties will be calculated, governance protocols, and how revenues will be shared (ideally facilitated by digital tools that deliver transparency) to decrease information asymmetry that can typically be a challenge for small market players. Licensing formats should consider income brackets, the willed use of the inventions (commercial, applied research or academic pursuit or development), and local priorities, while also anticipating open innovation pathways where inventors link the potential for an open-source project (technology transfer office) or develop the ideas with local registration and acceleration (of small quantities). Where royalty payments are recoverable through a fixed formula, the likelihood of hold-ups is diminished. Capacity-building requirements, such as for local contexts, technology transfers, joint R&D, and skills-based learning pathways should all demonstrate a matured understanding of the risks of innovation equity, and the reasoned trajectory pathways to uptake. Finally, oversight of potential anti-trust mitigations, including independent administration of license forms, required essentiality confirmations, non-discriminatory licensing, share caps, and effective dispute resolution mechanisms, help govern, guide, and safeguard prospects of regulatory ephemeral oversight while retaining trust in the pool for the long term.²⁵²

From limited group governance structures to active governance and accountability structures for inclusive patent pools

²⁵¹ Saif Ullah, *Patent Pools for Innovation and Sustainability*, in *Handbook of Intellectual Property and Sustainable Development* 123–145 (Fiona Smith & Rahul Verma eds., Springer 2024), https://link.springer.com/chapter/10.1007/978-3-031-88443-6_7.

²⁵² *Multi-Stakeholder Initiatives as Platforms for Collective Governance in Development*, World Bank Blogs (Apr. 10, 2023), <https://blogs.worldbank.org/en/governance/multi-stakeholder-initiatives-platforms-collective-governance-development>.



To moving from a form of concentrated exclusionary model for patent pools to a form that is representative of and inclusive to local and international communities, vaster and geographically balanced governance structures on transparency, neutrality, and accountability model would engage representation for all parties with equal representation by geography, sector and institution (and preferably small businesses, academic institutions and civil society, and for innovative actors from developing economies in deliberative governance processes). The first stage would require an articulate mission statement that reflects a shared system of goals for fair (to a point) returns for innovators at the same time as access opportunities for large groups seeking public technology. Governance structures may reside outside a shareholders approach. Licensing fees are to be handled by independent non-profit training administrators who would govern the patents included in a jurisdiction, determine whether a patent was essentiality, collect and distribute fees, and take equity actions that fraudulently included patents, governing their relationships with full disclosures for proponents and users through annual reports, audited expenses and metrics on and adoption of their alternatives. Disclosures for licensing terms and formulas for royalties, and revenue sharing, should be mandated to establish equity within groups seeking technology alternatives; combined with a waiver form for royalties for particular terms from least developed countries (LDC) could work to accelerate more equitable technology diffusion. Governance structures would also need to be open-source and facilitative for preferenced licensing or non-commercially critical approaches to social good, service or a contract; governance structures would need robust dispute resolution processes to avoid deadlock approaches considering an expert panel, arbitration, and clearly mandated timelines for each level of grievances. Patent pools committed to equitable governance structures and practices can align political economies with public good purpose to avoid monopolistic regulatory oversight while maximising development impacts.²⁵³

CASE STUDIES: LEARNING FROM THE GLOBAL AND INDIAN MODELS OF PATENT POOLS

Case studies serve as real-world examples to illustrate how patent pools operate and their limitations; they are an extraordinary method to understand how collaborative licensing schemes can result in equity for innovation, or be an obstacle to equity. Through case studies across varied sectors-

²⁵³ *Patent Pools and Collaborative Innovation in the Technological Industry*, Legal Vidhiya (July 15, 2023), <https://legalvidhiya.com/patent-pools-and-collaborative-innovation-in-the-technological-industry/>.



consumer technology, public health, and sustainable innovation- we can see whether collaborative licensing schemes support or hinder equity.

MPEG-LA Patent Pool: Technological Success; Equity Issues

MPEG-LA, which was established in the late 1990s, remains the most well-known global patent pool in a multimedia technology sector. MPEG-LA brought together patents necessary to establish video compression standards, for example, MPEG-2, H.264/AVC, and HEVC, all of which are the basis for technologies such as DVDs, BluRay discs, digital television broadcasting, streamable content, etc. MPEG-LA created a single licensing interface to license hundreds of interrelated patents, allowing the practice of licensing to be far easier, reducing the risk of infringement disputes, and permitting many actors to rapidly adopt interoperable standards. However, both the tangible and intangible costs associated with the pool's creation, and determined by separately target-licensing fees, created an equity equity barrier. Weater fees determined by large multinational corporations (typically charge hundred of thousands, if not million of dollars) caused severe financial burdens on small scale manufacturers, start-ups, and developers in low-resource settings. Whether intended or not, MPEG-LA's governance would not allow participation by players of the global south due to not having spaces for representation by actors from emerging economies, or having a differentiation in the terms of entry into the pool (in one space or another, participants impose the same terms on entry into their collaboration (setting up a fee structure around royalties)). While player members could not foresee the prospect, this would severely limit options for innovators in the global south to gain the business benefits of belonging to the very standards they helped produce. The MPEG-LA experience demonstrates the importance of including accessibility measures and inclusive governance into pool structures to promote efficiency that does not sacrifice equitable access.²⁵⁴

Medicines Patent Pool (MPP): Public-Interest Licensing for Global Health

Founded in 2010 with UNITAID funding and backed by the World Health Organization, the MPP operates under fundamentally different principles with clear public health and social justice goals. The MPP operates in a non-profit voluntary licensing space, and negotiates on behalf of pharmaceutical patent holders to license life-saving medicines for generic manufacturers to produce—primarily aimed at HIV, tuberculosis, hepatitis C, and, recently, COVID-19 therapies. The MPP design includes many

²⁵⁴ *VIA Licensing and MPEG LA*, VIA Licensing (last visited Aug. 8, 2025), <https://www.via-la.com/via-licensing-and-mpeg-la/>.



features that leverage equity: non-exclusive licenses that allow competition among generics; tiered pricing structures to enhance affordability; and transparent licenses that are available for public use. Importantly, the governance of the MPP includes:

- public health experts
- members from civil society organizations

common decision-making is based on patient need vs. commercial considerations. The MPP has provided almost 3000 medicines access to more than 100 low-and-middle-income countries, while advancing technology transfer, local capability of production, coupled with developing country market building as part of licencing requirements. This model illustrates that patent pools can embody public health principles and inclusivity and effectuate technology diffusion at scale without sacrificing incentives for innovation.²⁵⁵

Sisvel Pool: Domain of Revenue Sharing versus Inclusivity

Sisvel, originally created in Italy, has created patent pools across wireless communications, audio-visual technology and other high-technology areas. Sisvel has a wider revenue sharing agenda than many commercial pools which are focused on a corporate venue. Unlike others, Sisvel seeks to share revenue with smaller scope (IP) owners, and public research groups, a derived form of equity as their mission is to share revenue with more extensive kinds of innovators. Sisvel knows that they, too, are entitled to a share of licensing revenue and, while they know there are a number of pool licensing of licensing structures that will depend on market capacity, Sisvel is engaging with pool licensing structures on the basis of improving access for the small and medium enterprises (SMEs). While they appear to be applying flexible licencing options that will support greater access by the SME-stakeholder's, it is also appreciating the difference in stakeholder engagement and representation.²⁵⁶

LOT Network: Defensive Licensing against Patent "Trolling"

LOT (License on Transfer) Network: it is not actually a patent pool, but it offers an innovative pooling, or collective licensing model, to deter patent aggression. With both international corporate names and

²⁵⁵ *ViiV Healthcare Extends Voluntary Licensing Agreement with Medicines Patent Pool to Enable Access to Innovative Long-Acting Injectable HIV Treatment*, GSK (June 15, 2023), <https://www.gsk.com/en-gb/media/press-releases/viiv-healthcare-extends-voluntary-licensing-agreement-with-medicines-patent-pool-to-enable-access-to-innovative-long-acting-injectable-hiv-treatment/>.

²⁵⁶ *Sisvel Patent Pools: Good for Licensees, Good for Licensors, Good for Innovation*, Sisvel (Apr. 12, 2023), <https://www.sisvel.com/insights/sisvel-patent-pools-good-for-licensees-good-for-licensors-good-for/>.



start-ups as members, the LOT Network allows ranked members to agree that if any patents are sold to a non-practicing entity (to a "patent troll") that every member gets a free license- to sell, or use it. As a defensive planning process for deciding who is going to acquire their patent, this process also serves to mitigate the likelihood of opportunistic litigation, or the legal disadvantage for limited innovators (i.e. SMEs). Although LOT does not commercialize new technologies directly, it does provide protectors for innovators so that there is no need for them to worry about predatory litigation, and they can just concentrate on the R&D process.²⁵⁷

The Electric Vehicle Sector in India: Exploring the Case of Public Interest Patent Pools

The electric vehicle (EV) sector in India is quickly becoming a central case study for the industrial transition and sustainable environmental practices. The sector is currently characterized by fragmented ownership of intellectual property (IP), resulting in exorbitant costs associated with technology transfer, and most importantly, no standardization. By examining developments in other countries, for example, collaborations amongst Germany's small to medium enterprise (Mittelstand) network of organizations or state-supported collaborative vehicle technology programs in China, there is the potential to examine and develop policy-based patent pools for EV projects within India. A patent pool could be a collective approach which would rank and bundle relevant technologies in relation to battery management systems, charging infrastructure or other required elements of energy efficiency and sustainability while incentivizing fair licensing terms and taking advantage of existing ecosystems in support of start-ups, micro and small enterprises and pre-established means of public science. By limiting access to IP to a sector-based policy case, there is not only the potential for India to rapidly adopt EV's, but generally pursuing public interest objectives.²⁵⁸

India's Green Technology Pool: A Climate Change Patent Process

India has articulated patent pooling as a potential mechanism to address current challenges relating to ongoing sustainability issues concerning clean energy and electric mobility. NITI Aayog (government) and the Council of Scientific and Industrial Research (CSIR) (government) are launching a new initiative to find patents with climate mitigation relevance into a program that will bundle them into a

²⁵⁷ *Patent Trolls and LOT Network: How Tech Giants Like Google, Dropbox, and Microsoft Are Fighting Patent Assertion Entities*, Legal Dive (Mar. 15, 2023), <https://www.legaldive.com/news/patenttrolls-LOTnetwork-patentassertionentities-Google-Dropbox-Microsoft-intellectualproperty-IP/626065/>.

²⁵⁸ NITI Aayog, *Electric Vehicles: Roadmap for Adoption and Manufacturing* (2025), <https://www.niti.gov.in/sites/default/files/2025-08/Electric-Vehicles-WEB-LOW-Report.pdf>.



joint licensing agreement-- these patents will include technologies relating to solar, battery storage, EV technologies, and carbon capture/storage. The goal is to remove the bottleneck of IP which prevents or threatens a range of protocols for reducing emissions. The Green Patent Pool would introduce licensing fees below market for in-country start-ups, micro and small enterprises, clean tech incubators, and academic research institutions, with a focus on reducing market-entry regulation. In principle, if the pool is designed well, it could enable a more meaningful participant in climate technology markets. If there is sufficient design of the pool, equitable royalty approach, inclusivity, and synergized multi-stakeholder governance mechanism, it could be a mechanism for climate relevant IP decision-making--as it could represent a viable path towards streamlining proprietary technology and addressing relevant climate change and development shortcomings.²⁵⁹

India's Open COVID Pledge: Temporarily Waiving Enforcement Rights in Support of Public Health

Throughout the COVID-19 pandemic Indian research institutes, including CSIR, engaged in a partnership with some industry groups, particularly the Tata Group, and engaged in the Open COVID Pledge. This international initiative encouraged IP holders to make available technology relevant to the novel virus on a free of charge basis during the public health crisis. Patent holders have agreed to suspend enforcement of their rights on significant innovations (due to COVID-19), such as ventilator designs, diagnostics kits, and treatments, to enable the rapid development of these vital technologies by local producers and innovators without regulatory hurdles. The post-emergency hopeful framework evidenced the potential for sufficient scale for temporary royalty-private licensing mechanisms to support rapid interventions to emergent public health obligations, and that the integration of equitable and applicability-based IP protections did not compromise future assigned innovation incentives when the context returns to a hopefully pre-COVID arrangement. However, the "Open COVID Pledge" evidenced the prominence that patent systems could be designed temporally and as status necessitates (beyond health crises) to support humanitarian emergency requirements, while maintaining patents to the (old) IP model.²⁶⁰

²⁵⁹ *India and UAE Sign Comprehensive Economic Partnership Agreement*, Press Information Bureau, Government of India (Aug. 7, 2025), <https://www.pib.gov.in/PressReleasePage.aspx?PRID=1901585>.

²⁶⁰ National Health Mission, *Guidance Note: COVID-19 Emergency Response and Health System Preparedness Package* (2020), https://www.nhm.gov.in/New_Updates_2018/COVID-19%20ER&HSP%20PACKAGE/Guidance%20note_COVID%20package.pdf.



PATENT POOLING IN EMERGING MARKETS: BARRIERS AND PATHWAYS TO INCLUSION

Emerging economies like India, Brazil, and South Africa have considerable potential for research, development, and manufacturing, yet they are absent from patent pools because of high licensing costs, limited mechanisms to enforce intellectual property rights, and exclusion from governance forums²⁶¹. Addressing these barriers will require a combination of reforms and targeted incentives. Projects implementing compulsory pooling provisions during times of public health or climate emergencies can help ensure timely access to critical and life-saving technologies. India and a few other innovations also established a form of localized public pooling channels like Open Source Drug Discovery (OSDD) and Medicines Patent Pool (MPP). This localized framework incentivizing equitable participation is especially useful to navigate about industrialized markets. Implementing sector-based "green" technology pools organized through international treaties cf. UNFCCC or the G20²⁶² can acknowledge existing agreements and accumulate transparency and capacity to allow CLT to occur more swiftly. While a diversity of approach can help create options, existing regulatory and jurisdictional remain obstacles to feasibility, so any framework should work towards increasing feasibility with existing structures. For example, finding a way to insert differential pricing based on objective metrics like GDP per capita or revenue thresholds would help patents license holders develop affordable licensing without incurring long negotiation periods. Local production rights, and sublicensing arrangements, could enable domestic production, rather than relying on imports; for example, Canadian access to health including an increase use of PLR licensing rights to favour access and keep domestic production. The capacity building fund financed by royalties or support from donors can improve technical infrastructure via providing access to training programs, certification sites, and test laboratories. A humanitarian licensing carve-out organizer should apply to make sure firms are not forced to charge even in humanitarian crises if public health and environmental events established innovations may be used royalty free by public or non-profit organizations pursuit of the public good. Entry costs can be reduced, patent analytics can be made available while incentive programs vocational universities and local innovators can be increased to enhance the innovation

²⁶¹ *Emerging Markets Like Brazil, South Africa Initiate Reforms in Patent Laws in Line with India's IP Policy*, *Economic Times* (Oct. 16, 2013), <https://economictimes.indiatimes.com/news/economy/policy/emerging-markets-like-brazil-south-africa-initiate-reforms-in-patent-laws-in-line-with-indias-ip-policy/articleshow/24624904.cms>.

²⁶² Vijay Kumar, *Patent Pools and Sustainable Innovation: A Pathway to Green Technology Diffusion*, 15 *Environ. Sustainability* 97 (2025), <https://link.springer.com/article/10.1007/s43621-025-01513-1>.



ecosystem or expand, thereby reducing reliance on multinational licensors²⁶³ and empowering emerging markets so they have a more equal voice in Global Technological Governance and policy-making processes²⁶⁴.

EQUITY GAP IN HIGH-TECHNOLOGY SECTORS

Closing the Equity Gap

The equity gap we find in patent pools continues to produce distorted royalty structures, disproportionate representation of people from developing countries, an increased worry about antitrust implications, and a systematic exclusion of small, grassroots innovators in patents with pooled intellectual property. These inequities undermine the transformative power of pooled IP while threatening to deepen existing access and technological divides. Pooled IP should provide open, transparent royalty benchmarks that discourage arbitrary pricing for all stakeholders, alongside formal representation mechanisms in governance²⁶⁵ structures to ensure opportunities for small actors, public interest actors, and innovators from the Global South. Regulatory clarity can allow opportunities for collaboration and shared effort while reducing the risk of anti-competitive behaviour, and thereby improve contributors' certainty about their opportunities and benefits. Connecting local innovation ecosystems to global IP networks (via capacity building programs; regional licensing hubs; knowledge-sharing networks) could complement structural gaps to help ensure that pooled patents enjoy equity in economic impact across contexts we categorise as economic.

High-tech sectors and economic implications

Patent pools can radically reduce the risk of innovation blockade in heavy patenting industries such as telecommunications, AI, and Biotechnology. In telecommunications, FRAND²⁶⁶ access provides interoperability opportunities which can produce a new rollercoaster experience in technology space. In biotechnology, patent pools have potential to enable faster access to life-saving commercialisation and licensing, e.g., CRISPR. In crossover domains like AI and machine learning, the prevalence of cross-discipline patents and need for cross-discipline licensing models should not hinder important

²⁶³ *Patent Filing in High-Growth Markets: India, Brazil, and Beyond*, PatentPC (Mar. 3, 2024), <https://patentpc.com/blog/patent-filing-in-high-growth-markets-india-brazil-and-beyond>.

²⁶⁴ *Understanding Licensing Agreements in India*, KSandK (Aug. 1, 2023), <https://ksandk.com/startups/understanding-licensing-agreements-in-india/>.

²⁶⁵ World Intellectual Property Organization, *Patent Pools: A Solution to the Problem of Access in Technology Licensing* (2012), https://www.wipo.int/export/sites/www/competition-policy/en/docs/patent_pools_report.pdf.

²⁶⁶ *The Rise of FRAND Interim Licenses*, Wolters Kluwer Patent Blog (Apr. 12, 2024), <https://legalblogs.wolterskluwer.com/patent-blog/the-rise-of-frand-interim-licenses/>.



innovative solutions emerging today... As a place to start, economic models recognisant all aspects of royalties which favour inventors, while addressing new economic models of access and affordability. So much stacking of royalties leads to excessive downstream costs that may no longer justify innovation. Hybrid or capped royalties can alleviate this excessive stacking of royalties risk particularly in new or developing markets where affordability is more important to adoption.

PROPOSED MODULAR ARCHITECTURE FOR EQUITY-CENTERED POOLS

Modular architecture to reimagine pools

The modular architecture for patent pool presented in this paper provides a tiered model that can be applied to areas that present a range of sectoral norms as well as policy priorities. The Core Licensing Layer brings together the essential patents necessary to support a basic technological standard; there are in effect two conditions surrounding these patents, which are FRAND-like terms for the licensee and no limitations on royalties for non-commercial and humanitarian purposes. This enables interoperability across patents, and addresses technological blockade in the contexts, environments, and industries patents could be used to be put into practice under. The Differential Access Layer provides optional tiers of licensing that support the licensee's economic situation and social goals; there could be lower or other support systems set out for firms operating in emerging markets, or for development-based partners or academic institutions. The Equity and Capacity Layer provides guarantees around certain social obligations, such as, commitments around technology transfer, documentation, training, and co-development arrangements, to make sure licensees can put technologies into effect in action under the patents in practice, by a range of actors. Lastly, the Governance and Enforcement layer provides that oversight is through an independent licensing administrator or organization that is responsible for, inclusion of patents into the pool, collection of fees on behalf of the pool, dispute resolutions, will prepare annual reports to ensure competition but also fair access.²⁶⁷

Licensing Mechanics for Equity and Efficiency

To realize equitable licensing, the grants in the pool can be delivered using standardized formulas and contract instruments that establish a neutral economic mechanism, and reduce negotiation time, while

²⁶⁷ *SEPs and Pooling: Issues and Insights*, NJLRI (Apr. 10, 2025), <https://www.njlrii.com/2025/04/seps-and-pooling-issues-and-insights.html>.



ensuring fairness can theoretically occur in practice there. A GDP-²⁶⁸linked royalty formula is an example of how to translate an economic capacity into the fee and reward economies of scale through volume discounts. Some variation of a non-assertion clause offered to lower-tier licensees will allow those licensees to operate within the technology parameters of the license/ pool without threat of litigation. Assuming this language in the licensing agreements and some defensive termination clauses in the required SLAs, you would have some assurance of equitable access, depending on the nature of the licensee's misuse of the technology that breached the non-assertion aspects of the agreement. Licensing to enable a wholesale practice, within sublicense rights would provide some obligations on the sub-licensees with respect to compliance and reporting. This opens opportunities for local manufacturing, or the creation of local value. Licensors should also consider at least providing the base "implementation kit" of know-how that could be part of any package from - for instance reference designs, testing suites, interoperability tools, etc., to make sure patents can be put into practice without technical barriers that may be insurmountable.

MONITORING IMPACT AND REPORTING COMPLIANCE

To fully appreciate the impact of the pool, a data driven monitoring mechanism is required. Continuing indicators might be the success of adoption, numbers of licensing activity happening in emerging economies, and time-to-market for products that are built using pooled patents. Mechanisms for understanding economic impacts to monitor might include job creation, increased revenue or growth in the SME cohort, or just improved local manufacturing or associated activity. Indicators of access will hopefully include some manner of public reporting to indicate how many licenses are issued, with lower-cost tiers, and hopefully this was the case even in advance of that reporting, on top of reporting on contributed projects or standards through research and development. Considerations of independent audits and board made mechanisms for public dashboards, should be important considerations for accessing legitimacy of usage of social value, and a deterrent against misuse or misrepresentation of funded outcomes.²⁶⁹

Implementation, Risks and Mitigation

²⁶⁸ Rohit Deo & N. Balasubramanian, *Royalty on Intellectual Property: Analysis of Principal Issues*, IIM Bangalore Working Paper No. 2018-06 (2018), https://www.iimb.ac.in/sites/default/files/2018-06/Royalty%20on%20IP%20Analysis%20of%20Principal%20Issues%20-%20Working%20Paper_0.pdf.

²⁶⁹ U.S. Patent No. 8,379,538 B2, filed Dec. 3, 2008, and issued Feb. 19, 2013.



The starting point for implementation is to convene the stakeholders - industry, academia, regulatory agencies and development agencies - to ensure there is agreement on objectives. A pilot pool in a narrowly defined, high impact area allows for governance and pricing models to be investigated and tested prior to scaling. Independent evaluations of the pilot's impact on competition and equitable access would enable refinements. Risks need to be managed to limit the occurrence of potential capture by incumbents, regulatory challenges and free-riders; mitigation approaches might include capping voting rights, engaging with regulatory agencies early on, conducting compliance audits and reviewing royalties regularly. By embedding mitigation strategies from the beginning, the pool can meet innovation objectives without compromising public welfare.

POLICY SUPPORT AND INTEGRATION

Regulators and donors are key enablers of equitable pools. Competition authorities could provide guidance and temporary safe harbours²⁷⁰ for pools meeting straightforward, defined inclusivity and transparency requirements. Donor agencies and development banks, in particular, could offer pooled capacity funds to bolster joint technologies that strengthen the adoption of technologies in neglected regions of the world. Governments could also align procurement policies with equitable licensing terms so that new, compliant products have market pull. Bundled formalized essentiality processes across countries could significantly lower transaction costs and maximize consistency especially the rigorous inclusivity assessment and the open process of revising prices. With these policy initiatives, equitable patent pools could be a permanent fixture in the governance of innovation worldwide. The Road Forward: Reimagining Patent Pools for Equitable Innovation

As the global economy shifts towards a knowledge-based pathway, the role of patent pools must evolve from what has been as collaborative instruments of commercial operational efficiency. Historically, the purpose of patent pools has been to help reduce transaction costs, overcome patent thickets, and encourage technology standardization in complex sectors. While the objectives listed above remain paramount, a vision for the future to move ahead requires that patent pools become also tools for inclusive innovation by democratizing access to critical technologies, and allowing for equitable participation of others in the global innovative economy. This becomes even more important

²⁷⁰ International Council of Voluntary Agencies, *Pooled Funding Models and Governance Systems* (Dec. 2023), <https://www.icvanetwork.org/uploads/2023/12/ICVA-Pooled-Funding-Models-Governance-Systems.pdf>.



for innovators in emerging markets, who need to cultivate knowledge-building in the face of various financial, institutional, and legal barriers that limit them from using intellectual property as a crucial enabling tool.

To take this vision of reimagining patent pools for equity a step further, we need to acknowledge the structural asymmetries that exist within the underlying inequity that damage our potential to rethink our models including governance structures that are subject to powerful multinational organizations who are often the dominant users of patent pools over others (e.g., small inventors, academic and higher education institutions, public research organizations, and actors from the Global South), which are important actors whose voices need to be represented in order to make decision making equitable. The consolidation of decision-making power creates inequities in technology access, licensing agreements, and benefit sharing. If pools do not change, and allow for equitable benefit-sharing, these patent pools run the risk of facilitating monopoly-like behaviours to serve their own ends, rather than as tools of collective technological advancement.

CONCLUSION

Patent pools can lead to shared technological advancement if they are founded on principles of equity, transparency, and inclusivity. Social justice principles, coupled with collective models of innovation, can close the gap between technological innovation and social impact by enabling the transition of intellectual property from exclusionary tools to equitable models of prosperity for all. Developing new governance models that optimize participation rather than power, access-oriented licensing policies, and law that prevents exploitive practices will be required. As Dr. Yusuf Hamied²⁷¹ articulated, "Access to knowledge is the superpower of development. Patent pools must be bridges not barricades." If today, we rethink what collaborative IP frameworks can mean, embracing the components of social justice, sustainable development, and equitable economic growth, patent pools will become the foundation of a truly global commons of knowledge and innovation



²⁷¹ Yusuf Hamied, *Wikipedia*, https://en.wikipedia.org/wiki/Yusuf_Hamied (last visited Aug. 8, 2025).



CHAPTER 09

ENSURING FAIRNESS IN SEP LICENSING: OVER-DECLARATION, ESSENTIALITY CHECKS AND POLICY REFORM

- Dr. Srinidhi Choudharymettl*

ABSTRACT

Standard Essential Patents play a pivotal role in ensuring interoperability in standard-driven technologies such as 5G and Internet of Things (IoT). To facilitate the access and dissemination of such essential technologies, SEP holders are expected to disclose patents that may be essential during the standard-setting process. They are expected to commit to licensing their patents on terms that are Fair, Reasonable and Non-Discriminatory (FRAND). However, Standard Setting Organisations (SSOs) typically do not verify whether these declared patents are actually essential to the standard. This lack of verification has led to widespread over-declaration; where non-essential patents are included in SEP portfolios. Over-declaration leads to several fundamental issues in the SEP system such as inflated royalty rates, legal uncertainty and competitive disadvantages for smaller implementers. This paper addresses the problem of over-declaration and explores certain mechanisms that can help reduce over-declaration and improve transparency and fairness in SEP licensing. The study adopts a doctrinal and policy-based methodology for examining the frameworks of SSOs such as ETSI and IEEE. It also focuses on the judicial approaches and practices from patent pools that perform independent essentiality assessments. It also briefly evaluates the potential and limitations of using AI-based tools in automating these assessments. This paper also distinguishes between technical and commercial essentiality, which shows how inconsistent interpretations by SSOs contribute to ambiguity in SEP declarations. It argues that without essentiality checks, the SEP system is bound to skew in favour of SEP holders. This undermines licensing fairness, distorts competition and affects access to standardized technologies in emerging markets.

KEYWORDS: Standard Essential Patents (SEPs), Over-Declaration, Fair Reasonable and Non-Discriminatory (FRAND), Essentiality Checks, Competition

INTRODUCTION

Fairness lies at the core of the Standard Essential Patent (SEP) licensing system. In standard-driven technological sectors such as 5G and Internet of Things (IoT), ensuring access to patented

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technologies is essential for innovation, competition and market participation. Hence, SEP holders are required to license their SEPs on terms that are Fair, Reasonable and Non-Discriminatory (FRAND). These FRAND terms are intended to balance patent rights with public access to standardized technologies and prevent exclusionary and discriminatory licensing regimes. However, as evidenced by the litigation in the SEP system, it has been observed that there is a lack of transparency in the declaration and licensing of SEPs.²⁷²

The major reason for this is the largely unchecked over-declaration of non-essential patents as essential. Standard Setting Organizations (SSOs) such as European Telecommunications Standards Institute (ETSI) and the Institute of Electrical and Electronics Engineers (IEEE) are responsible for the development, dissemination and fair licensing of SEPs. They require SEP holders to disclose patents that may be potentially essential to a standard and commit to licensing them on FRAND terms. However, these organizations do not independently verify the actual essentiality of the declared patents.²⁷³ This has resulted in the phenomenon of over-declaration of essential patents to a standard, leading to bloated SEP portfolios that create significant asymmetry in licensing negotiations through inflated royalty rates, legal uncertainty and impediment to competition for smaller implementers.²⁷⁴ Academic studies have confirmed that many declared SEPs do not meet the technical threshold of essentiality.

This paper addresses the problem of over-declaration in the SEP system. It examines its causes, consequences, and potential solutions by analysing SSO policies, case law, and patent pool practices. Part 2 of the paper explores the phenomenon of over-declaration in SEP licensing. It explains the causes of over-declaration; how and why SEP holders declare non-essential patents as essential. It also delves into the consequences of over-declaration. Part 3 deals with the importance of essentiality determination, the challenges faced in conducting essentiality checks and the assessment methods that are currently used. Part 4 of the paper proposes reforms that would address the problem of over-declaration.

²⁷² Damien Geradin, *SEP Licensing After two Decades of Legal Wrangling: Some Issues Solved, Many Still to Address*, TILEC Discussion Paper No. DP2020-040 (2020), <https://ssrn.com/abstract=3547891> (last visited Aug. 8, 2025)

²⁷³ EUROPEAN TELECOMMUNICATIONS STANDARDS INSTITUTE (ETSI), *ETSI Intellectual Property Rights Policy*, Clause 4.1 (Apr. 14, 2023), <https://www.etsi.org/images/files/IPR/etsi-ipr-policy.pdf>. (last visited Aug. 8, 2025)

²⁷⁴ Robin Stitzing et al., *Over-Declaration of Standard-Essential Patents and Determinants of Essentiality* (Oct. 27, 2017), <https://ssrn.com/abstract=2951617> (last visited Aug. 8, 2025). <http://dx.doi.org/10.2139/ssrn.2951617> (last visited Aug. 8, 2025)



UNDERSTANDING OVER-DECLARATION

Over-declaration refers to the practice of labelling patents as essential to a technical standard, despite the fact that products adhering to the standard would not infringe upon the claims of those patents.²⁷⁵ In simpler terms, when SEP holders assert non-essential patents as essential to the standards, it leads to an inflated number of SEPs, which is called as over-declaration. Disclosure of essential patents by SSO members is an essential part of the standard-setting process. During the formulation of a standard, the SSOs require their members to reveal any patents that they hold that could be pertinent to the proposed standard. If members do not disclose their SEPs at this stage, they may forfeit the opportunity to negotiate licensing terms and could later be accused of engaging in patent ambush. Fearing this, SSO members often resort to a practice known as “over-declaration.” They claim a greater number of their patents as essential to a standard than is actually necessary for compliance. This practice has been documented by studies such as those conducted by Fairfield Resources International.²⁷⁶

In order to identify the patterns of over-declaration, these studies assess SEPs by performing technical evaluations and examining the outcomes of SEP-related litigation. One such report found that over-declaration is rampant, where only 27% of the patents declared essential to the GSM standard were essential. This meant that 72% of the SEPs required to implement the GSM standard were not essential, *i.e.* they would not be infringed while an implementer implements the standard. Similarly, in the LTE standard, 500 out of the 1,100 patents that were declared as essential were found to be non-essential.²⁷⁷ The European Commission also regularly highlights the issue of patent essentiality as a matter requiring close scrutiny.²⁷⁸

CAUSES OF OVER-DECLARATION

²⁷⁵ Cody M. Akins, Overdeclaration of Standard-Essential Patents, 98 Tex. L. Rev. 579 (2020), <https://texaslawreview.org/overdeclaration-of-standard-essential-patents/>

²⁷⁶ FAIRFIELD RES. INT’L, ANALYSIS OF PATENTS DECLARED AS ESSENTIAL TO GSM AS OF JUNE 6, 2007, (2007), Available at http://frlicense.com/GSM_FINAL.pdf (last visited Aug. 8, 2025)

²⁷⁷ FAIRFIELD RES. INT’L, REVIEW OF PATENTS DECLARED AS ESSENTIAL TO LTE AND SAE (4G WIRELESS STANDARDS) THROUGH JUNE 30, 2009, at 2 (2010), <http://www.frlicense.com/LTE%20Final%20Report.pdf> (last visited Aug. 8, 2025)

²⁷⁸ PIERRE RÉGIBEAU ET AL., CHARLES RIVER ASSOCS., TRANSPARENCY, PREDICTABILITY, AND EFFICIENCY OF SSO-BASED STANDARDIZATION AND SEP LICENSING 40 (European Commission, 2016) <https://ec.europa.eu/docsroom/documents/20506/attachments/1/translations/en/renditions/native> (last visited Aug. 8, 2025)



Over-declaration in SEP licensing is not a random occurrence. It arises due to a combination of procedural, strategic and institutional shortcomings in the standard-setting ecosystem. This following sub-sections explore the causes that enable over-declaration.

Early Disclosure Requirements

Standard-setting process is long drawn, stretching to years. Many SSOs such as ETSI require members to disclose potentially essential patents early in the standard development process, even before the final technical specification is defined. This often leads to a situation where the patents that may appear relevant during disclosure may not be found to be essential to the final version of the standard. As a result, patents that were declared as essential in the early phase may later prove irrelevant. However, they still remain in the SEP database leading to over-declaration.²⁷⁹

Inclusion of Rejected or Narrowed Patent Applications

A common contributor to over-declaration is the inclusion of patents that are in the review process *i.e.* patents that were not granted the patent status. If the patent is later modified or rejected by the patent office, it no longer may be relevant to the standard. For instance, if a patent's claims are narrowed during prosecution, the scope of the patent may no longer include the standard, making it non-essential.

Unverified or Misleading Declarations

In some cases, patent holders knowingly declare non-essential patents as SEPs without analysing whether their patents are truly essential to the standard being developed. They often engage in this practice to gain benefits associated to having patents that are accorded SEP status. This not only undermines the integrity of the SEP system, it also affects royalty rates and competition. The absence of mandatory essential checks by SSOs further enable such opportunistic behaviour by SEP holders.

Lack of Transparency in SSO Rules

The procedures adopted by SEP disclosures vary significantly from each other. However, they generally lack clear and uniform definitions of what constitutes a standard-essential patent. This creates ambiguity which is further exacerbated by lack of essentiality checks post disclosure. It allows for broad interpretations and inconsistent application of disclosure obligations.

²⁷⁹ Jorge L. Contreras, *Much Ado About Hold-Up*, in *The Cambridge Handbook of Technical Standardization Law: Competition, Antitrust, and Patents* 297, 304–05 (Jorge L. Contreras ed., Cambridge Univ. Press 2018), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3123245. (last visited Aug. 8, 2025)



Strategic and monetary incentives for over-declaration

SEP holders often overstate the essentiality of their patents to increase their influence in the standard-setting process. By engaging in over-declaration, SEP holders increase their bargaining power and demand higher royalty rates from licensees/implementers. This practice gives them an opportunity to demand inflated royalties, especially in technology-driven sectors where royalties can impact profitability.

CONSEQUENCES OF OVER-DECLARATION

Over-declaration has significant economic and legal consequences for the SEP framework. Primarily, it results in expensive and protracted litigation and uncertainty of patent ownership and validity. It also creates barriers to innovation and standard adoption. Over-declaration harms consumer welfare as licensing fees increase conditions that foster anti-competitive practices. This environment restricts the entry of new players into the market and disrupts collaborative innovation efforts. Importantly, over-declaration hurts the primary objective of “interoperability” of the standard-setting system. It misdirects financial resources of implementers as they have to engage in cost-intensive litigation to fight the over-declaration.

Legal Disputes

One of the most immediate outcomes of over-declaration is increased litigation between SEP holders and licensees. Litigation involves issues surrounding essentiality of SEPs, patent infringement allegations on implementers by SEP holders, and disagreements over what is FRAND. For instance, in the case *Unwired Planet v. Huawei*²⁸⁰, Unwired Planet, an SEP holder, accused Huawei of patent infringement after the latter used the claimed SEPs without a license. Following unsuccessful licensing negotiations, the UK High Court granted an injunction against Huawei, compelling it to accept a FRAND license from Unwired Planet.

Complex and Prolonged Licensing Negotiations

Licensing negotiations between SEP holders and licensees are often lengthy and inefficient. When an implementer thinks that the SEP holder has an overstated SEP portfolio, they contest the essentiality of the SEPs, thereby extending the licensing negotiations. Determining essentiality at this stage is a time-intensive process which further increases the transaction costs of SEP licensing. The ambiguity

²⁸⁰ *Unwired Planet Int'l Ltd. v. Huawei Techs. Co.*, [2020] UKSC 37.



and uncertainty arising from inflated patent portfolios further make it difficult to determine FRAND royalties.

Encouragement of Anti-Competitive Behaviour

Over-declaration facilitates anti-competitive behaviour through patent holdup. Patent holdup occurs when SEP holders exploit their bloated SEP portfolios to wield excessive market power and demand unreasonably high royalty rates. Licensees give in to the high royalty rates as they have already invested substantial economic resources in the process of adhering to a standard. This unfortunate circumstance fosters monopolistic behaviours, restricts competition by discouraging new entrants into the market.

Market Instability and Market Fragmentation

The inflated SEP portfolios that are caused by over-declaration can lead to significant market instability as it scares organizations from adopting industry standards due to fears of unpredictable licensing. Such fears in new players intending to enter into the market can delay or disrupt standard adoption, which results in fragmented markets that undermine the foundational goals of standardization, viz., interoperability and cohesive market growth. These market instabilities not only reduce confidence in standards but also impede technology adoption and dissemination.

DETERMINING ESSENTIALITY: IMPORTANCE, CHALLENGES AND METHODS

Determining the essentiality of SEPs refers to checking whether a declared SEP is truly required to implement a standard. It is important to perform essentiality checks of SEPs at the earliest to ensure transparency, fairness and a balance of power between the licensee and SEP holder during licensing negotiations. As noted in the preceding section, the lack of essentiality checks creates a conducive environment for over-declaration, which can increase transaction costs, impede innovation and competition. This section explores why essentiality checks matter, the challenges involved and the different methods to check for essentiality used around the world.

IMPORTANCE OF ESSENTIALITY VERIFICATION

SEP declarations are made voluntarily by patent holders at the time of standard-setting. However, there is no requirement for the patent to be verified as actually essential before making this declaration. This leads to many non-essential patents being declared as essential without confirming their relevance



to the standard.²⁸¹ As a result, SEP holders often over-declare with the intention of increasing their SEP portfolios. This over-declaration makes SEP licensing both expensive and confusing. It also pressurises smaller companies and developers in emerging markets who do not have the financial resources to engage in litigation. Essentiality checks help in aligning the declared patents with the actual technical requirements of the standard. This reduces the risk of litigation and preserves the integrity of the FRAND commitment.

TECHNICAL VS. COMMERCIAL ESSENTIALITY

One of the major reasons contributing to over-declaration is the differences between technical and commercial essentiality. In the standard-setting system, a patent is considered to be technically essential when it is the only available solution to implement a standard without infringing upon existing patents. In other words, technical essentiality implies that there is no alternative patent that could achieve the same function without violating the patent. However, in a few cases, there could exist multiple essential patents that can be used to implement a standard. Some of them may be easy to apply and cheap, and others may be costly or complex. In such cases, the SSOs opt for the most cost-effective solution. This gives rise to what is called commercial essentiality. A patent can be considered commercially essential to a standard when it is used not because there are no other technical options, but because the other options are too costly or difficult to use. Even though multiple alternatives exist, the SSOs pick the most affordable or practical option. In these cases, the chosen patent becomes “essential” not for technical reasons but for commercial reasons.

Most SSOs generally favour commercial essentiality as it reduces licensing costs for implementers. However, organizations like the European Telecommunications Standards Development Institute (ETSI) are a minority that firmly adhere to technical essentiality. In its 2021 IPR policy²⁸², ETSI defines essential IPRs as follows:

“ESSENTIAL as applied to IPR means that it is not possible on technical (but not commercial) grounds, taking into account normal technical practice and the state of the art generally available at the time of

²⁸¹ Brachtendorf, L., Et AL., (2023). *Truly standard-essential patents? A semantics-based analysis* J. OF ECON. & MGMT. STRATEGY, 32(1), 132-157 (2023) Available at <https://doi.org/10.1111/jems.12500> (last visited Aug. 8, 2025)

²⁸² Guide on Intellectual Property Rights (IPRs), (10 June 2021) Available at <https://www.etsi.org/images/files/IPR/etsi-guide-on-ipr.pdf> (last visited Aug. 8, 2025)



*standardization, to make, sell, lease, otherwise dispose of, repair, use or operate EQUIPMENT or METHODS which comply with a STANDARD without infringing that IPR.*²⁸³

Furthermore, ETSI provides clarification through an additional provision:

*“For the avoidance of doubt in exceptional cases where a STANDARD can only be implemented by technical solutions, all of which are infringements of IPRs, all such IPRs shall be considered ESSENTIAL”*²⁸⁴

One can infer that ETSI is firm in its position that only IPRs that are necessarily infringed on technical grounds shall be considered as essential. Even in cases where multiple technical solutions exist, ETSI will treat them as essential irrespective of the cost. ETSI clearly states that commercial factors do not matter, and commercial impracticality cannot be the reason to exclude technically valid alternatives.

In contrast to ETSI, the Institute of Electronics and Electrical Engineers (IEEE) adopts a broader interpretation that favours commercial essentiality. IEEE’s policy defines essential patent claims as those for which no alternative implementation method exists that is both technically and commercially feasible at the time of standard approval.

*“Essential Patent Claim” shall mean any Patent Claim the practice of which was necessary to implement either a mandatory or optional portion of a normative clause of the IEEE Standard when, at the time of the IEEE Standard’s approval, there was no commercially and technically feasible non-infringing alternative implementation method for such mandatory or optional portion of the normative clause.*²⁸⁵

INSTITUTIONAL AND ECONOMIC BARRIERS TO DETERMINING ESSENTIALITY

Most SSOs do not have a protocol in place to check whether a patent is actually essential to the standard. They lack both the resources and the technical know-how needed to carry out such essentiality assessments. Patent Pools, however, usually conduct thorough essentiality checks to determine whether the declared patents are truly essential or not. These assessments are carried out by independent experts, who are usually qualified patent attorneys. These essentiality checks help in avoiding crowding the pool with non-essential or irrelevant patents. However, hiring these independent experts comes at a high cost of up to \$7,500 per patent.²⁸⁶

²⁸³ *I.d.*

²⁸⁴ *I.d.*

²⁸⁵ Institute of Electrical and Electronic Engineers (IEEE) , *STANDARDS BOARD BYLAWS – CLAUSE 6 – 8*, Available at, <https://standards.ieee.org/about/policies/bylaws/sect6-7/> (last visited Aug. 8, 2025)

²⁸⁶ JORGE L. CONTRERAS, *CAMBRIDGE HANDBOOK OF TECHNICAL STANDARDIZATION LAW - ANTITRUST, COMPETITION AND PATENT LAW* (Cambridge University Press, 2018)



In Europe, the cost of determining essentiality varies depending on who conducts the assessment. An in-house review within the company might cost around 2,000 euros per patent, while an external firm could charge as much as 9,000 euros per patent.²⁸⁷ Essentiality assessments are a costly affair. For instance, in the *TCL v. Ericsson*²⁸⁸ case, the cost of assessing Ericsson's SEP portfolio for essentiality was estimated at around 26 million dollars for 2,600 SEPs covering 2G, 3G and 4G standards. Manual assessments are favoured generally but they are often expensive and inaccurate. Added to this, the methods used for assessments are not standardized which results in inconsistencies and unreliability. The details of the assessment methods and how the data is processed are rarely disclosed to the public, affecting transparency.

ESSENTIALITY ASSESSMENT METHODS

As noted above, there are no set assessment methods for determining essentiality. However, we also have established that determining the essentiality of SEPs is critical to maintaining a fair and reasonable SEP system. Without any set assessment methods or checks, the SEP system risks being overwhelmed by over-declarations and non-essential patents. This can distort licensing negotiations, increase transaction costs, and undermine innovation and competition. There is currently no universally adopted method or standard framework for assessing whether a patent is truly essential to a given technical standard. This has prompted scholars, researchers, industry stakeholders, and even courts to propose different assessment methods. These methods broadly fall into two categories; manual assessment by independent experts and automated assessment through artificial intelligence (AI) based tools.

Manual Assessment by Independent Experts

Patent Pools have resorted to manual assessment conducted by independent experts for determining the essentiality of patents that want to get admitted into the pool. This practice can be traced back to the 1990s when MPEG-2 video compression standards were being developed. Responding to the concerns about anti-competitive behaviour of patent pools, the Antitrust Division of the United States Department of Justice (DOJ) issued Business Review Letters to the concerned patent pools.²⁸⁹ These letters were issued to ensure that the operations of the pool were in compliance with competition law.

²⁸⁷ *I.d.*

²⁸⁸ *TCL Communication Tech. Holdings, Ltd. v. Telefonaktiebolaget LM Ericsson* (C.D. Cal. 2017)

²⁸⁹ U.S. Dep't of Justice (DOJ). 1997–MPEG-2 Letter. Letter from Joel I. Klein, Acting Assistant Att'y Gen., Antitrust Div., U.S. Dep't of Justice, to Garrard R. Beeney, Sullivan & Cromwell LLP (Jun. 26, 1997).



The letters required them to only include patents those patents into the pool that were truly essential and had no technical alternative. This was done to ensure that the patent pool did not create an unfair licensing environment.²⁹⁰

The DOJ strongly recommended that patent pools must conduct an essentiality analysis of patents before admitting them into the pool. It also added that patents within the pool must complement each other and not be substitutes. To adhere to these directives, patent pools developed a process for conducting essentiality assessments. They require patent holders to provide detailed explanations justifying why each declared patent is essential to the relevant standard. These assessments are then outsourced to independent third-party evaluators such as law firms specialised in the area.²⁹¹ This independent vetting prevents the pool from getting bloated with non-essential patents.

A prominent example is the 3rd Generation Partnership Project (3GPP), which was established shortly after the DOJ's letter.²⁹² 3GPP was established to develop 3G standards and later expanded its work to include 4G and 5G. In the 3GPP, patents are grouped and licensed separately for each generation of standards, and each group undergoes independent review. In some cases, assessments are conducted in parallel by different experts and the results are compared to improve accuracy. This method has helped improve transparency and has become a benchmark for accurate essentiality assessment. Manual evaluations are not only confined to patent pools. Manual assessment is often used by courts where they rely on assessments conducted by academic researchers, technical experts, or economic consultants to help them decide on FRAND royalty rates.²⁹³ The biggest downside of this method is the substantial cost involved. Additionally, since the assessment methods and data analysis steps are not made public, it raises questions about the transparency of this method.

Assessment through Automation

Due to the high cost and time-consuming nature of manual assessment, researchers and industry stakeholders have resorted to exploring automated ways to determine essentiality. Artificial Intelligence (AI) is a faster, cheaper, and more scalable when compared to manual assessment,

²⁹⁰ The letters clearly articulated the same “*The limitation of the Portfolio to technically essential patents, as opposed to merely advantageous ones, helps ensure that the Portfolio patents are not competitive with each other and that the Portfolio license does not, by bundling in non-essential patents, foreclose the competitive implementation options that the MPEG-2 standard has expressly left open*”

²⁹¹ *I.d.*

²⁹² RUDI BEKKERS ET. AL. OVERCOMING INEFFICIENCIES IN PATENT LICENSING: A METHOD TO ASSESS PATENT ESSENTIALITY FOR TECHNICAL STANDARDS, (Elsevier, 2022)

²⁹³ *Unwired Planet v Huawei* [2020] UKSC 37, *TCL v Ericsson* (Fed. Cir. Mar. 13, 2018), and *In re Innovatio IP Ventures* MDL No. 2303, Case No. 11 C 9308



especially when dealing with thousands of declared SEPs. The biggest advantage of automation is that it can process huge volumes of patent data quickly and at a much lower cost compared to manual assessments. Using AI to determine essentiality overcomes the limitations that come with human evaluators, such as bias, inconsistency or errors in interpretation.

One of the well-known efforts in this area comes from Brachtendorf et al., who developed a system for automated essentiality assessment based on semantic comparison. In their method, the language of the patent claims is compared with the requirements of the relevant technical standard. The comparison is done based on the similarities in meaning. They used an algorithm called Octimine, which is capable of reading and understanding large bodies of text, identifying patterns and matching them with other texts. It is also equipped with automatic grammar correction tools and pre-processing functions that help in dealing with the complex language found in patent documents.²⁹⁴ The algorithm has accurately assessed the essentiality of SEPs in *TCL vs. Ericsson*.²⁹⁵

Automation shows a great potential for essentiality assessment, but there are concerns regarding its reliability due to the technology being in early stages. Semantic-based tools depend heavily on the language of the patent claims, which varies across sectors or evolves over time. This reliance on language will work only if the language of the patent claims and standards align. Even though automation removes human bias but it also introduces a lack of transparency, as the decision-making process of algorithms is often unclear. Nevertheless, automated methods address the limitations of manual assessment of scale, cost, and efficiency. With improvements in language processing and algorithmic transparency, AI could become a dependable tool for essentiality checks.

PROPOSALS OF REFORM TO CURB OVER-DECLARATION

Over-declaration has become a persistent challenge in the SEP system. It has made SEP licensing hostile as it causes inflated royalty rates and frequent litigation. This undermines the FRAND objective of SEPs and weakens the trust in the SEP system as a whole. While SEPs play a crucial role in ensuring interoperability and promoting technological advancement, the absence of essentiality checks is allowing opportunistic SEP holders to create large SEP portfolios without any accountability. This

²⁹⁴ Brachtendorf, L., Et AL., (2023). *Truly standard-essential patents? A semantics-based analysis* J. OF ECON. & MGMT. STRATEGY, 32(1), 132-157 (2023) Available at <https://doi.org/10.1111/jems.12500> (last visited Aug. 8, 2025)

²⁹⁵ *Ericsson Inc. v. TCL Commc'n Tech. Holdings, Ltd.*, No. 18-2003 (Fed. Cir. 2020), Available at <https://law.justia.com/cases/federal/appellate-courts/cafc/18-2003/18-2003-2020-04-14.html>. (last visited Aug. 8, 2025)



has created an imbalance in the power dynamics of the SEP holder and the implementers, where the latter is forced to agree to the high royalty fee demand of the former. This section proposes a set of reforms that aim to address the issues that arise due to over-declaration.

UNIFORM DEFINITION OF ESSENTIALITY

SSOs should arrive at a common definition and requirements of essentiality as an important step towards mitigating over-declaration. A fundamental cause of over-declaration is lack of consistency among SSOs in how they define essentiality. These inconsistencies give an opportunity SEP holders to exploit the permissive definitions thereby inflating their SEP portfolios. For instance, ETSI limits declarations to patents that are technically essential, i.e. the patent is strictly necessary to implement the standard with no available non-infringing alternatives. In contrast, the IEEE follows commercial essentiality IEEE permits declarations even when alternatives exist, provided they are not commercially feasible. This causes significant ambiguity into the global SEP ecosystem. This allows SEP holders to declare patents that are not essential. It complicates licensing negotiations, hinders accurate royalty determination, and increases the risk of litigation over patents that may not truly be essential. A uniform definition benefits implementers as the lack of clarity forces them into expensive litigation. A uniform definition would create a consistent baseline for SEP disclosure and improve the credibility of declared SEP portfolios. It would also help courts in establishing global SEP licenses and cross-jurisdictional comparison of SEP claims. In the long term, a consistent definitional framework would strengthen the integrity of the SEP system.

MANDATORY ESSENTIALITY CHECKS BY THIRD-PARTIES

Another way to mitigate over-declaration is to introduce third-party verification of essentiality. Patent pools like MPEG LA, Avanci and Via Licensing already use third-party essentiality checks to vet whether a patent is actually essential to a given standard.²⁹⁶ SSOs should require that the declared SEP must undergo an independent technical assessment. These assessments can be carried out by neutral experts who not affiliated with either the patent owner or the implementer. However, as noted in the previous section, these independent assessments are expensive. To remedy this, SSOs can set up shared-cost models, or local governments could subsidize verification for smaller companies and

²⁹⁶ Expert Group on Licensing and Valuation of Standard Essential Patents, *Contribution to the Debate on SEPs* (Feb. 2021), <https://preubohlig.de/wp-content/uploads/2021/02/SEPs-Expert-Group-Contribution-to-the-Debate-on-SEPs.pdf>. (last visited Aug. 8, 2025)



startups. Over time, the costs would be offset due to the lack of litigation costs on over-declaration. The US court in *TCL v. Ericsson*²⁹⁷ employed a sampling method; a subset of declared patents was verified for essentiality. The court decided on royalty rates for the entire portfolio based on the sample. This method highlights the potential for independent assessments.

PENALIZING OVER-DECLARATION

The current SEP system rewards a higher number of declarations over declaring patents that are essential. Patent holders can declare a large number of non-essential patents without any consequence. This inflates the SEP portfolios and distorts licensing negotiations as the implementers assume all declared patents must be licensed. To remedy this, SSOs can create an incentive structure that favours accuracy over volume. SSOs can push their members only to declare those patents that are verified as essential to the standard.

OPEN-ACCESS SEP DATABASES

Implementers often struggle to determine which patents are truly essential to the standard. They also fail to know whether the SEPs have been verified, the licensing terms that apply, or from whom to seek a license from. This information asymmetry disproportionately benefits SEP holders and leads to inflated royalty demands, protracted negotiations, and unnecessary litigation.²⁹⁸ To address this, SSOs should collaborate with national IP offices and competition authorities and develop SEP open access databases. These databases can contain SEP declarations, verification results, claim charts, licensing terms and status updates on essentiality assessments. This ensures transparency and gives implementers a clear view of their potential SEP exposure across multiple standards. For instance, tools like the IPlytics by LexisNexis platform provide SEP analytics by aggregating data from SSOs, patent offices, and litigation dockets on a subscription basis.²⁹⁹ However, these platforms are commercial and often too expensive for smaller companies. A publicly accessible registry would reduce the cost. The European Commission, in its 2017 Communication on SEPs, explicitly

²⁹⁷ *Ericsson Inc. v. TCL Commc'n Tech. Holdings, Ltd.*, No. 18-2003 (Fed. Cir. 2020), Available at <https://law.justia.com/cases/federal/appellate-courts/cafc/18-2003/18-2003-2020-04-14.html>. (last visited Aug. 8, 2025)

²⁹⁸ Contreras, Jorge L., *Much Ado About Holdup* (February 13, 2018). 2019 University of Illinois Law Review 875, University of Utah College of Law Research Paper No. 269, <http://dx.doi.org/10.2139/ssrn.3123245>

²⁹⁹ LexisNexis IPlytics, <https://www.lexisnexisip.com/solutions/ip-analytics-and-intelligence/iplytics/> (last visited Aug. 8, 2025)



recommended improving the quality and accessibility of information in SEP databases.³⁰⁰ However, SEP holders are not enthusiastic about providing information regarding their SEPs and their terms of license to the public. This database could also be maintained in consultation with the World Intellectual Property Organisation (WIPO) where an international database can be created using the national databases. Even if such databases cannot completely eliminate the problem of over-declaration, they will equip implementers, courts and licensing bodies with tools to detect and challenge questionable SEP declarations. Creating such a database would not eliminate the problem of over-declaration. But it would equip implementers, courts, and licensing bodies with better tools to detect, challenge, or weigh questionable SEP claims, thereby improving the overall integrity of the licensing ecosystem.

CONCLUSION

Over-declaration is one of the most pertinent challenges in the SEP system. It creates an imbalance in SEP licensing negotiations by giving patent holders disproportionate power over the implementers. The overlooked problem of over-declaration threatens the integrity of the SEP licensing framework. While the FRAND commitment strives to ensure fair and non-discriminatory access to essential technologies, the absence of essentiality checks has created a loophole for SEP holders to engage in opportunistic behaviour. They demand high royalty rates and wield power over the implementers and arm-twist them into accepting their demands. This problem is prominent in emerging economies like India, where there are more implementers of standards than SEP holders. This paper suggests various ways in which this challenge can be dealt with. This paper recommends a uniform definition of essentiality; independent essentiality checks by third parties and penalties for over-declarations. These measures can create a balanced and accountable SEP framework. These proposals not only benefit the implementers but also protect the integrity of the SEP system.



³⁰⁰ European Commission, Communication on Setting Out the EU Approach to Standard Essential Patents, COM(2017) 712 final (Nov. 29, 2017).



CHAPTER 10

WIPO'S ROLE IN HARMONIZING SEP DISPUTES: MYTH OR POSSIBILITY?

- Dr. Gargi Bhatt*

ABSTRACT

Standard Essential Patent (SEP) disputes have emerged as a major challenge in the global intellectual property landscape, marked by inconsistent judicial and regulatory approaches to FRAND (Fair, Reasonable, and Non-Discriminatory) obligations. With courts and competition authorities across the United States, European Union, China, and India adopting divergent stances on SEP licensing and injunctions, the lack of international coherence risks undermining innovation, licensing transparency, and fair competition. The point of discussion here is that to what extent can the World Intellectual Property Organization (WIPO) serve as an effective platform for the harmonization of SEP disputes, particularly in relation to divergent licensing interpretations across jurisdictions? This legal commentary explores the potential role of the WIPO in harmonizing SEP dispute resolution. It assesses WIPO's institutional capacity, particularly the Arbitration and Mediation Centre as a neutral and effective venue for resolving SEP-FRAND disputes outside of national court systems. The analysis also considers WIPO's soft law tools, including model frameworks and technical guidance, as possible instruments for establishing consistent international practices. Drawing on recent SEP litigation trends, international standards setting debates and policy developments, this commentary argues that while WIPO offers valuable procedural infrastructure, its influence in substantive harmonization remains limited without active engagement from member states and private stakeholders. The paper concludes by evaluating whether a future multilateral protocol on SEP licensing and dispute resolution under WIPO's aegis is a realistic prospect or merely a theoretical construct amid geopolitical and commercial tensions.

Keywords: WIPO, Standard Essential Patents, FRAND, International IP law, Patent Licensing, Dispute Resolution

INTRODUCTION

As global technology standards proliferate, Standard Essential Patents (SEPs) become increasingly central to innovation, competition, and market access. Disputes arise over what constitutes FRAND

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(Fair, Reasonable, and Non-Discriminatory) licensing terms, as well as whether a patent is truly essential to a standard. Given the jurisdictional fragmentation, conflicting court decisions, and high stakes involved, harmonization of SEP dispute resolution is more critical than ever.³⁰¹ This paper explores the role of the World Intellectual Property Organization (WIPO) in harmonizing disputes related to SEPs in the post 2010 litigation landscape. Focusing on the complexities of FRAND licensing, this scholarly study examines the feasibility and implications of a WIPO led harmonization effort. It addresses arguments supporting and challenging the efficacy of WIPO initiatives, targeting international policymakers and legal scholars within the technology and intellectual property fields.³⁰² The discussion herein delves into the mechanisms provided by WIPO, including its global dialogue platform, knowledge and data hub, Alternative Dispute Resolution (ADR) services, and direct support to stakeholders. With analyzing these components and associated case studies, the paper presents an in-depth examination of current litigation frameworks and offers recommendations for future improvements. SEPs have emerged as a critical component for implementing technical standards globally. A SEP, by definition, is a patent that is essential for complying with a technical standard, and therefore any manufacturer wishing to comply must obtain a license. The global standardization landscape has experienced significant growth increasing the frequency of disputes particularly regarding these issues affecting the global market at large.

One of the most prominent aspects of WIPO's initiative in harmonizing SEP disputes is its range of ADR services. The WIPO Arbitration and Mediation Center specializes in assisting parties engaged in FRAND licensing disputes by offering structured mediation and arbitration services. With steering disputes away from prolonged litigation processes, these ADR mechanisms provide cost-effective and timely resolutions that are particularly beneficial to small and medium-sized enterprises (SMEs), which often face financial and logistical constraints.³⁰³ The mediation process allows parties to narrow down the contentious issues without necessarily reaching full settlement in every case, which can still facilitate more efficient negotiations and encourage cooperation. The flexibility inherent in ADR procedures is especially appealing in the context of FRAND disputes where ambiguity in determining

³⁰¹ World Intellectual Property Organization, WIPO ADR for FRAND Disputes, <https://www.wipo.int/amc/en/center/specific-sectors/ict/frand>

³⁰² World Intellectual Property Organization, Standard Essential Patents, <https://www.wipo.int/web/patents/topics/sep>

³⁰³ World Intellectual Property Organization, Arbitration and Mediation: Resolving Patent Licensing Disputes in the World of Standardized Technology, <https://www.wipo.int/web/wipo-magazine/articles/arbitration-and-mediation-resolving-patent-licensing-disputes-in-the-world-of-standardized-technology-42960>



what constitutes ‘fair’ and ‘reasonable’ licensing can otherwise lead to protracted disputes. Furthermore, WIPO's ADR services help standardize processes across different legal systems, reducing jurisdictional inconsistencies that have been a perennial challenge in SEP litigation. Courts in leading jurisdictions increasingly view participation in such processes as evidence of a willing licensor, which can influence FRAND determinations. For instance, the Delaware District Court in *InterDigital v. ZTE and Nokia* encouraged arbitration as a “possible way to proceed” in lieu of ineffective litigation.³⁰⁴

BACKGROUND AND WIPO'S INITIATIVES IN SEP DISPUTE RESOLUTION

The rapid development of technology and the increasing reliance on standardized protocols have placed SEPs at the centre of many high-stakes disputes. WIPO has recognized that a harmonized approach to resolving such disputes can greatly benefit the international legal landscape and commercial practices. To address these challenges, WIPO has developed a multi-faceted strategy based on four thematic clusters. The Global Dialogue Forum serves as a platform for intellectual property practitioners and policymakers worldwide to debate and shape the legal framework governing SEPs. Complementing the Forum is WIPO's Knowledge and Data Repository. Through resources like the WIPO Lex SEP Case Law Collection, WIPO facilitates a comprehensive understanding of judicial decisions related to SEP disputes. This database not only supports legal research but also fosters a consistent interpretation of complex FRAND obligations, which has historically varied across jurisdictions. WIPO has also established its Arbitration and Mediation Centre to function as an amicable venue for dispute resolution. With offering ADR services such as mediation and arbitration, WIPO aims to provide a less adversarial and more cost-effective alternative to traditional litigation. These initiatives are further bolstered by WIPO's role as a service provider, tailoring dispute resolution processes specifically designed to address the nuances of SEP-related litigations. The vision underlying these efforts is to eventually produce a harmonized regulatory framework in which binding and predictable outcomes can be achieved across jurisdictions without sacrificing flexibility or stakeholder autonomy. With promoting consistent procedural standards and facilitating voluntary yet structured dispute resolution such as mediation with expert involvement or arbitration under uniform rules.

³⁰⁴World Intellectual Property Organization, Arbitration and Mediation: Resolving Patent Licensing Disputes in the World of Standardized Technology, WIPO Magazine (Dec. 13, 2022), <https://www.wipo.int/web/wipo-magazine/articles/arbitration-and-mediation-resolving-patent-licensing-disputes-in-the-world-of-standardized-technology-42960>



WIPO aims to reduce fragmentation in SEP enforcement and licensing.³⁰⁵ This, in turn, enhances legal certainty, lowers transaction costs, and fosters a more balanced global innovation ecosystem.

ANALYSIS OF RECENT DISPUTES UNDER WIPO PROTOCOLS

An inspection of SEP disputes over the last decade highlights a mixed record concerning the efficacy of WIPO's dispute resolution mechanisms. In several instances, WIPO's ADR processes have facilitated prompt settlements between parties who might otherwise have engaged in prolonged litigation. For example, cases documented in the WIPO Lex SEP Case Law Collection demonstrate that parties have successfully utilized mediation to reach mutually satisfactory outcomes without resorting to costly court battles. These settlements have underscored the benefits of a harmonized approach in managing disputes that span multiple jurisdictions.³⁰⁶ However, other cases reveal the limitations of WIPO's approach. In some disputes, particularly those involving large multinational corporations, parties have expressed reservations about the enforceability of outcomes reached through non-judicial channels.

The reluctance to rely solely on WIPO protocols has prompted stakeholders to continue seeking redress through established national tribunals, where legal precedents and judicial enforcement are more predictable.³⁰⁷ This divergence in practice has, in some respects, reaffirmed the notion that while WIPO's ADR services are valuable, their role is not yet sufficiently authoritative to fully harmonize SEP dispute resolution globally. Furthermore, while WIPO's documentation of case law has contributed significantly to legal scholarship and helped standardize certain aspects of SEP litigation, it has not yet overcome the challenges identified with respect to enforcement. This situation is compounded by the fact that there is still a considerable degree of variability in how different jurisdictions perceive and apply FRAND principles.³⁰⁸ The analysis of recent disputes indicates that the aspiration to resolve SEP conflicts through a universally binding WIPO mechanism remains, at present, more of an ideal than a reality.

³⁰⁵ World Intellectual Property Organization (WIPO), Alternative Dispute Resolution (ADR), <https://www.wipo.int/amc/en>

³⁰⁶ WIPO, Standard Essential Patents (SEP): Use of Alternative Dispute Resolution for SEP Disputes, <https://www.wipo.int/amc/en/events/workshops/2022/sep/index.html>

³⁰⁷ <https://academic.oup.com/book/34595/chapter-abstract/294243807?redirectedFrom=fulltext>
<https://academic.oup.com/book/34595/chapter-abstract/294243807?redirectedFrom=fulltext>

³⁰⁸ https://scholarship.law.umn.edu/cgi/viewcontent.cgi?article=1896&context=faculty_articles



POLICY RECOMMENDATIONS FOR ENHANCING WIPO'S HARMONIZATION ROLE

WIPO could expand its role as a knowledge and data repository by enhancing the coverage and accessibility of the SEP Case Law Collection. This enhancement would facilitate comparative legal analyses and promote a consistent approach to interpreting SEP disputes.³⁰⁹ It is also recommended that WIPO further develop its ADR services to include hybrid models that combine mediation with adjudicative elements, thereby increasing the authority of resolutions reached. By integrating aspects of arbitration that carry a quasi-binding nature, WIPO could - if agreed upon by the parties in advance - render outcomes that are enforceable under international law.³¹⁰

Beyond procedural reforms, there is also an imperative to address the underlying cultural and institutional resistance to relinquishing national autonomy over intellectual property disputes. Efforts to foster a more harmonized environment should include capacity building initiatives and awareness campaigns aimed at illustrating the long-term benefits of an integrated approach³¹¹. These measures would not only promote a better understanding of WIPO's role but also encourage stakeholders to embrace the uniformity that a binding international framework could provide.

FUTURE PROSPECTS FOR BINDING MECHANISMS AND GLOBAL COOPERATION

Looking ahead, the future of SEP dispute resolution under WIPO's auspices appears to be at a crossroads. While the current framework remains largely advisory, evolving global trade dynamics and technological advancements necessitate a more uniform and binding approach. It is conceivable that through concerted diplomatic and legal efforts, WIPO could assume a more authoritative role. One avenue for progress lies in the gradual convergence of national legal doctrines concerning FRAND obligations, an evolution that may be fostered by increased dialogue and collaboration. Strengthened international cooperation potentially in the form of a new multi-lateral treaty-could empower WIPO to function as an effective central adjudicator in SEP disputes.³¹²

³⁰⁹ World Intellectual Property Organization, WIPO: Arbitration & Mediation Center, <https://www.wipo.int/amc/en/>

³¹⁰ World Intellectual Property Organization, WIPO ADR Options for FRAND Disputes Management and Resolution (Nov. 4, 2022), <https://www.wipo.int/edocs/pubdocs/en/wipo-pub-rn2022-15-en-wipo-alternative-dispute-resolution-options.pdf>

³¹¹ World Intellectual Property Organization, WIPO Alternative Dispute Resolution (ADR) Options for Intellectual Property and Technology Cases Pending Before National Courts, <https://www.wipo.int/amc/en/center/specific-sectors/ipoffices/national-courts/index.html>

³¹² World Intellectual Property Organization, WIPO Magazine — The Role of WIPO in Patent Law, <https://patentpc.com/blog/the-role-of-the-world-intellectual-property-organization-wipo-in-patent-law>



In addition, there are opportunities to integrate technological innovations into the dispute resolution process. The adoption of digital platforms and artificial intelligence in processing and comparing judicial decisions might further streamline the harmonization of legal interpretations around SEPs³¹³. These technological advancements could also serve to enhance transparency in decision-making, a key factor in gaining the trust of disputing parties. At present, however, the challenge remains to design dispute resolution procedures that are not only efficient but also endowed with sufficient binding authority to supersede regional legal divergences.

Ultimately, the prospects for instituting binding mechanisms hinge on the willingness of global stakeholders to cede a measure of national control in favour of a unified international system. The incremental successes of WIPO's ADR services provide a hopeful indicator; yet significant legal and political obstacles must be overcome before such a system can be realized. The international legal community must therefore remain committed to sustained dialogue and reform, balancing national interests with the collective benefits that a harmonized approach promises.

CONCLUSION

The role of WIPO in harmonizing disputes related to Standard Essential Patents encompasses both notable achievements and considerable challenges. While WIPO has succeeded in establishing valuable forums, data repositories, and non-binding ADR services that have facilitated the resolution of numerous disputes, the institution's ability to enforce binding decisions remains circumscribed by jurisdictional and conceptual limitations. Over the past decade, the evolution of SEP disputes and the diverse interpretations of FRAND obligations underscore a persistent tension between the ideal of global harmonization and the realities of national legal frameworks.³¹⁴ This commentary has shown that while WIPO's initiatives represent significant progress, they fall short of delivering an unequivocally binding dispute resolution mechanism. For WIPO to transcend its current advisory role, further international cooperation, enhanced enforcement strategies, and an integration of emerging technologies will be essential. Ultimately, the ambition to achieve uniform, binding resolution of SEP disputes rests on the ability of the international community to embrace substantial

³¹³ Outlining WIPO's 2024–2026 Strategy on Standard Essential Patents, WOLTERS KLUWER Patent Blog (May 16, 2024), <https://legalblogs.wolterskluwer.com/patent-blog/outlining-the-wipos-2024-2026-strategy-on-standard-essential-patents/>

³¹⁴ WIPO, Standard Essential Patents (SEP): Use of Alternative Dispute Resolution for SEP Disputes — Workshop (2023), https://www.wipo.int/en/web/amc/events/workshops/2023/sep_franc_disputes-mediation_webinar



legal reforms. To move beyond the realm of myth, concerted efforts are required to align national interests with globally enforceable standards, thereby laying the groundwork for truly harmonized dispute resolution in the field of Standard Essential Patents.³¹⁵ While the dream of a fully harmonized and binding international framework for SEP disputes remains a challenging prospect, incremental advances provide hope that such a system could eventually be realized. Continued dialogue, research, and policy innovation will be crucial in transforming WIPO's current model from an aspirational myth into a practical possibility for the global intellectual property community.



³¹⁵ WIPO, WIPO Strategy on Standard Essential Patents 2024–2026 (2024), <https://www.wipo.int/edocs/pubdocs/en/wipo-pub-rn2024-12-en-strategy-on-standard-essential-patents-2024-2026.pdf>



CHAPTER 11

PROTECTING INDUSTRIAL DESIGNS IN THE FASHION INDUSTRY: CHALLENGES, EMERGING TRENDS AND LEGAL REFORMS IN THE DIGITAL ERA

- Vineet*

ABSTRACT

*The fashion industry thrives on creativity, yet faces persistent challenges in safeguarding industrial designs from unauthorized replication, counterfeiting, and fast-fashion exploitation. In the digital era, the rise of social media, e-commerce platforms, and AI-generated designs has accelerated the pace of copying, while globalized markets complicate enforcement. This paper examines the legal protection of industrial designs in the fashion industry with a primary focus on India, complemented by comparative insights from jurisdictions such as the United States, European Union, and China. Using a doctrinal methodology, it analyzes statutory frameworks, international agreements like TRIPS and the Hague Agreement, and key judicial precedents including *Louboutin v. Yves Saint Laurent*, *Star Athletica v. Varsity Brands*, and *Karen Millen Fashions v. Dunnes Stores*. The study explores emerging challenges posed by fast fashion, AI-driven design tools, and counterfeit markets, and evaluates the limitations of existing enforcement mechanisms. Findings indicate that while industrial design protection laws exist, they are often inaccessible to independent designers due to high litigation costs, slow judicial processes, and jurisdictional inconsistencies. The paper advocates for simplified registration processes, stronger cross-border cooperation, technological tools such as blockchain authentication, and proactive platform accountability to address online infringement. With situating industrial design law within the realities of a fast-paced, digitally connected fashion industry, this research underscores the need for adaptive and harmonized legal reforms to balance innovation, accessibility and fair competition.*

KEYWORDS: Industrial Design Protection, Fast Fashion, Counterfeiting, AI in Fashion, Blockchain Authentication, Digital Infringement

INTRODUCTION

The fashion industry is a dynamic and rapidly evolving sector where creativity, innovation, and commercial viability are deeply intertwined. Industrial design plays a crucial role in defining the aesthetic appeal of fashion products, including clothing, footwear, and accessories. Unlike other

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intellectual property (IP) rights such as trademarks and copyrights, industrial design protection focuses on the visual and ornamental aspects of fashion items, distinguishing one designer's work from another. The significance of industrial design in fashion extends beyond aesthetics—it influences consumer behavior, brand identity, and market competitiveness. In a highly competitive industry where trends shift quickly, the ability to protect a designer's unique creations can determine the commercial success of a brand.

The economic significance of fashion design protection cannot be overstated. The global fashion industry is valued at over \$2.5 trillion, contributing significantly to employment and economic growth. Leading fashion houses and independent designers invest substantial resources into research, development, and innovation to create original designs that appeal to consumers. However, the industry's cyclical nature, combined with the rise of fast fashion, has intensified the risk of design infringement. Companies such as Zara, Shein, and H&M have been repeatedly accused of replicating high-end designs and selling them at a fraction of the cost, raising critical concerns about the adequacy of existing legal protections for fashion designs. Without effective industrial design protection, designers, particularly small and independent ones, struggle to compete against mass-market retailers that can reproduce and distribute similar designs at an accelerated pace.³¹⁶

Globalization has further exacerbated the challenges associated with fashion design protection. With digital platforms enabling the rapid dissemination of designs, piracy has become a significant issue. Social media and e-commerce platforms such as Instagram, Pinterest, and Alibaba facilitate the near-instantaneous copying and distribution of fashion designs, often in jurisdictions with weak IP enforcement mechanisms.

The fashion industry thrives on creativity, yet designers often struggle to protect their unique creations from unauthorized replication. With the rise of fast fashion, AI-generated designs, and digital authentication, traditional industrial design protections face new challenges. This study examines the effectiveness of existing legal frameworks, explores emerging threats, and proposes reforms to balance innovation, enforcement, and accessibility. Strengthening design protection is crucial for fostering creativity, ensuring fair competition, and promoting sustainable fashion practices in an increasingly globalized market.

³¹⁶ Bently, Lionel & Brad Sherman, *Intellectual Property Law* 245-267 (Oxford University Press, 5th ed., 2018).



INDUSTRIAL DESIGN PROTECTION IN THE FASHION INDUSTRY

Industrial design protection plays a critical role in preserving the uniqueness of fashion creations and ensuring that designers receive due recognition and economic benefits from their work. The fashion industry thrives on creativity, with designers investing time and resources in crafting distinctive silhouettes, patterns, textures, and accessories that define their brand identity. However, the highly competitive and fast-paced nature of fashion also makes it susceptible to design theft, counterfeiting, and unauthorized replication. While industrial design protection provides a legal mechanism to safeguard aesthetic and ornamental aspects of fashion products, its effectiveness remains a subject of debate due to various limitations in the legal framework.³¹⁷

DEFINITION AND SCOPE OF INDUSTRIAL DESIGN IN FASHION

Industrial design in fashion refers to the visual and aesthetic elements of a product that give it a unique identity and distinguish it from other designs in the market. These elements include silhouettes, patterns, textures, fabric designs, embroidery, embellishments, and accessories such as handbags, jewelry, and footwear. Unlike functional aspects, which may be protected under patents, industrial design law specifically covers the non-functional, decorative aspects of a product.³¹⁸

The scope of industrial design protection varies significantly across jurisdictions, and designers often rely on multiple forms of IP protection to safeguard their creations.³¹⁹ Therefore, one of the key challenges in fashion law is distinguishing industrial design from other forms of intellectual property (IP) rights, such as copyright and trademark. While copyright law protects artistic works, including textile patterns and graphic designs on clothing, it does not typically extend to the overall shape or structure of a fashion item. Trademarks, on the other hand, safeguard brand identifiers such as logos, names, and symbols rather than the design of the product itself. Industrial design protection fills this gap by offering exclusive rights over the ornamental features of a design, ensuring that competitors cannot copy or replicate the unique visual characteristics of a fashion product without authorization.³²⁰

LEGAL FRAMEWORKS FOR DESIGN PROTECTION

³¹⁷ Ibid.

³¹⁸ Patricia, *Pirates, Parodies and Publicity: Copyright Law and the Fashion Industry*, UNSW Law Journal, Vol. 27, No. 3, 889-906 (2004).

³¹⁹ Ginsburg, Jane C., *Copyright, Trademark, and Patent Strategies in the Fashion Industry*, Columbia Journal of Law & the Arts, Vol. 39, No. 2, 115-140 (2015).

³²⁰ Jacques, *Design Law: European and International Perspectives* 57-84 (Edward Elgar Publishing, 2013).



INTERNATIONAL LEGAL REGIMES

Given the globalized nature of the fashion industry, international legal frameworks play a crucial role in ensuring consistent protection for industrial designs across different countries. The Hague Agreement on the International Registration of Industrial Designs, administered by the World Intellectual Property Organization (WIPO), provides a streamlined process for registering industrial designs in multiple jurisdictions through a single application. This system benefits fashion brands seeking to protect their designs in various markets without undergoing separate national registration procedures. However, its effectiveness is limited by the fact that not all countries are signatories, and enforcement mechanisms vary widely.³²¹

The Hague Agreement on the International Registration of Industrial Designs provides a streamlined process for protecting fashion designs across multiple jurisdictions. Administered by the World Intellectual Property Organization (WIPO), this treaty allows designers to file a single application for international recognition, eliminating the need for multiple national filings. While this system significantly reduces administrative burdens, it is limited by the fact that not all countries are signatories, leading to inconsistencies in enforcement. The Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement also mandates minimum standards for industrial design protection but grants flexibility to national governments, resulting in varying legal interpretations. In the European Union, designers benefit from the Community Design system, which includes both registered and unregistered protections. Unregistered designs provide automatic, short-term protection, while registered designs offer long-term exclusivity. In contrast, the United States relies on design patents, which are costly and time-consuming to obtain. These international disparities create challenges for fashion brands operating globally, necessitating stronger harmonization efforts.

Another key international framework is the TRIPS Agreement (Trade-Related Aspects of Intellectual Property Rights), which sets minimum standards for IP protection, including industrial design rights. TRIPS mandates member countries of the World Trade Organization (WTO) to provide protection for independently created industrial designs that are new or original. However, the agreement leaves significant discretion to national governments regarding the specific requirements and duration of protection, leading to inconsistencies in design law enforcement across different regions. While TRIPS

³²¹ Ginsburg, Jane C., *Copyright, Trademark, and Patent Strategies in the Fashion Industry*, Columbia Journal of Law & the Arts, Vol. 39, No. 2, 115-140 (2015).



establishes a foundation for global design protection, the lack of uniform implementation creates challenges for fashion brands operating in multiple jurisdictions.³²²

COUNTRY-SPECIFIC LEGAL PROTECTIONS

National laws governing industrial design protection vary significantly, with some jurisdictions offering robust legal frameworks while others provide limited safeguards.

In the United States, industrial designs in fashion are primarily protected through design patents, which grant exclusive rights over the ornamental features of a product for a period of 15 years. Additionally, the Copyright Act may offer limited protection for certain textile prints and graphic elements, while trade dress protection under trademark law can be used to safeguard distinctive visual features associated with a brand. However, design patents are costly and time-consuming to obtain, making them impractical for fast-moving fashion trends. The threshold for trade dress protection is also high, requiring designers to prove that their design has acquired secondary meaning in the market. The European Union provides a more comprehensive system for industrial design protection through registered and unregistered Community designs under the European Union Intellectual Property Office (EUIPO). Registered Community designs offer protection for up to 25 years, while unregistered designs provide automatic rights for three years from the date of first public disclosure. This dual system benefits fashion designers by allowing immediate protection without the need for formal registration while also offering a long-term protection option for more commercially significant designs. However, enforcement challenges persist, particularly in cases where infringers exploit legal loopholes to avoid liability.³²³

In India, industrial designs are governed by the Designs Act, 2000, which provides protection for original and novel designs for a maximum period of 15 years. While this legal framework offers a relatively straightforward registration process, it has several limitations. The scope of protection is confined to registered designs, leaving unregistered designs vulnerable to copying. Additionally, the enforcement of design rights in India is often hindered by slow judicial processes and the high cost of litigation, making it difficult for independent designers and small fashion brands to assert their rights effectively.³²⁴

³²² Bently, Lionel & Brad Sherman, *Intellectual Property Law* 245-267 (Oxford University Press, 5th ed., 2018).

³²³ Jacques, *Design Law: European and International Perspectives* 57-84 (Edward Elgar Publishing, 2013).

³²⁴ Patricia, *Pirates, Parodies and Publicity: Copyright Law and the Fashion Industry*, UNSW Law Journal, Vol. 27, No. 3, 889-906 (2004).



China, a major player in the global fashion industry, has a complex IP regime that includes utility model patents, design patents, and ongoing reforms aimed at strengthening design protection. While China has made significant strides in improving IP enforcement, the prevalence of design piracy remains a major concern. Many fashion brands struggle with counterfeit products flooding the market, and legal proceedings against infringers can be time-consuming and costly. Recent reforms in China's IP laws, including stricter penalties for infringement and enhanced registration mechanisms, signal a positive shift toward better design protection, but challenges remain in ensuring consistent enforcement.³²⁵

EMERGING TRENDS IN INDUSTRIAL DESIGN PROTECTION

The landscape of industrial design protection in the fashion industry is evolving rapidly due to technological advancements, shifting consumer demands, and new business models. While traditional legal frameworks struggle to keep up with these changes, designers and brands are exploring innovative strategies to safeguard their creations. Emerging trends such as fast fashion, digital and AI-generated designs, sustainability, social media-driven replication, and collaborative design models have brought fresh challenges and opportunities in industrial design protection. Luxury brands, too, are adapting their approaches, moving away from excessive litigation to strategies focused on exclusivity and brand collaborations. These trends not only reshape how fashion design is protected but also redefine the industry's approach to intellectual property in the digital age.³²⁶

The rise of fast fashion brands such as Shein, Zara, and H&M has drastically altered the fashion industry's production cycle. These companies rely on a business model that enables them to produce high-fashion-inspired garments at significantly lower costs and within a short time. The speed at which fast fashion companies replicate and distribute their products often makes legal recourse ineffective, as by the time a lawsuit is resolved, the infringing design has already disappeared from the market. Additionally, the burden of proving substantial similarity and originality under existing legal frameworks creates significant hurdles for designers attempting to protect their work.³²⁷

³²⁵ Ginsburg, Jane C., *Copyright, Trademark, and Patent Strategies in the Fashion Industry*, Columbia Journal of Law & the Arts, Vol. 39, No. 2, 115-140 (2015).

³²⁶ Raustiala, Kal & Christopher Sprigman, *The Piracy Paradox: Innovation and Intellectual Property in Fashion Design*, Virginia Law Review, Vol. 92, No. 8, 1687-1777 (2006).

³²⁷ Ginsburg, Jane C., *Copyright, Trademark, and Patent Strategies in the Fashion Industry*, Columbia Journal of Law & the Arts, Vol. 39, No. 2, 115-140 (2015).



Another transformative force in industrial design protection is the growing role of artificial intelligence in fashion. AI-driven tools such as DALL·E and MidJourney enable designers and consumers to generate unique digital fashion designs with minimal human input. While this technology enhances creative possibilities, it also raises serious legal questions regarding ownership and originality. Since many AI-generated designs are created through algorithmic processes, determining who holds the industrial design rights—whether the programmer, the user, or the AI itself—remains unresolved under most IP laws. Additionally, these AI tools rely on vast datasets, often trained on existing designs, leading to potential copyright and design infringement concerns. To counterbalance these challenges, blockchain technology and non-fungible tokens (NFTs) have emerged as potential solutions for protecting digital fashion. By using blockchain to establish proof of ownership and authenticity, designers can secure their creations against unauthorized copying, though the practical enforcement of these protections remains in its early stages.³²⁸

The fashion industry's increasing focus on sustainability has also introduced new challenges in industrial design protection. As brands shift towards eco-friendly materials, zero-waste production methods, and circular fashion models, the need to protect sustainable innovations has become a growing concern. Many sustainable design techniques, such as biodegradable fabrics and upcycling methods, lack adequate legal protection under current industrial design laws. Unlike conventional designs, which focus on aesthetic originality, sustainable fashion involves functional innovations that often fall outside the scope of design protection, making it difficult for designers to prevent competitors from replicating their eco-friendly initiatives. One example is Stella McCartney's approach to sustainable fashion, where her brand has pioneered the use of plant-based leather and recycled materials while facing limited options for securing exclusive rights over these innovations. This gap in legal protection discourages some designers from investing in sustainable practices, as they risk losing their competitive edge to larger brands that can adopt similar strategies without facing infringement claims.³²⁹

CHALLENGES IN ENFORCING INDUSTRIAL DESIGN RIGHTS IN FASHION

Enforcing industrial design rights in the fashion industry presents significant challenges due to the complexity of legal battles, jurisdictional variations, counterfeiting, and the ongoing debate over the

³²⁸ Patricia, *Pirates, Parodies and Publicity: Copyright Law and the Fashion Industry*, UNSW Law Journal, Vol. 27, No. 3, 889-906 (2004).

³²⁹ *Supra* n. 12.



balance between creativity and protection. Despite the existence of international agreements and national laws aimed at safeguarding industrial designs, fashion remains an industry where copying is rampant, and legal remedies are often inaccessible or ineffective for many designers. While large corporations may have the resources to pursue lengthy litigation, independent designers and small brands struggle to protect their work, as legal costs, enforcement difficulties, and the fast-paced nature of fashion trends make litigation an impractical solution in many cases.³³⁰

One of the biggest challenges in enforcing industrial design rights is the costly and complex nature of legal battles. High-profile intellectual property disputes in fashion have often dragged on for years, consuming substantial financial and legal resources. For independent designers, taking on large corporations in court is not just expensive but also risky, as these cases frequently involve proving that an alleged infringer has copied a design substantially enough to warrant legal protection. Even in cases where a designer wins, the damages awarded may not justify the cost of litigation. For example, many emerging designers have accused fast fashion brands of replicating their work, yet the speed at which these companies produce and replace designs often makes legal action ineffective. The rise of counterfeiting and black market sales adds another layer of difficulty in enforcing industrial design rights. Counterfeit luxury brands have become a multi-billion-dollar industry, with fake versions of high-end products from brands such as Rolex, Gucci, and Chanel flooding markets worldwide. The expansion of e-commerce platforms like Alibaba, Amazon, and Taobao has further exacerbated this issue, as counterfeiters can now reach consumers directly through online marketplaces. The persistence of the counterfeit market underscores the limitations of traditional legal enforcement and the need for more proactive and technology-driven solutions.³³¹

China, a hub for manufacturing and fashion exports, has witnessed important design infringement cases as well. In *Michael Kors v. Dafeng Garment Co. (2019)*, Michael Kors sued a Chinese company for producing counterfeit handbags that closely resembled its signature designs. The Chinese court ruled in favor of Michael Kors, awarding damages and reinforcing China's commitment to stronger IP enforcement. This decision marked progress in industrial design protection in a jurisdiction often criticized for lax IP enforcement.³³²

³³⁰ Pollaud-Dulian, Frédéric, *Le Droit du Design et de la Mode*, LexisNexis, 245-273 (2015).

³³¹ Patricia, *Pirates, Parodies and Publicity: Copyright Law and the Fashion Industry*, UNSW Law Journal, Vol. 27, No. 3, 889-906 (2004).

³³² Pollaud-Dulian, Frédéric, *Le Droit du Design et de la Mode* 245-273, (LexisNexis, 2015).



One of the most high-profile luxury brand disputes was *Chanel v. What Goes Around Comes Around* (2023)³³³, where Chanel accused the vintage retailer of selling Chanel products without authorization and using misleading branding. While not purely an industrial design case, it raised questions about resale markets and the extent to which brands can control the secondary use of their designs.

Another major challenge in enforcing industrial design rights is striking the right balance between creativity and protection. The fashion industry thrives on inspiration, reinterpretation, and trends that evolve over time. While legal protection is essential to prevent blatant copying, overly strict enforcement of design rights can stifle creativity and limit artistic freedom. Some designers argue that the open nature of fashion allows for innovation and that excessive legal barriers could hinder the creative exchange that drives the industry forward. The debate over how much protection is necessary—and where to draw the line between inspiration and infringement—continues to be a contentious issue in fashion law.³³⁴

Grey areas in fashion law further complicate enforcement efforts, particularly in cases where copyright and design protection overlap. In many jurisdictions, industrial designs are granted protection primarily for their aesthetic features, while functional elements fall outside the scope of design law. This distinction becomes problematic when a design incorporates both functional and decorative aspects, as determining the appropriate form of protection can be ambiguous. Additionally, copyright law does not always provide adequate protection for fashion designs, as it often requires a higher threshold of originality and artistic expression. Legal battles over whether a particular design qualifies for copyright protection have resulted in conflicting rulings, creating uncertainty for designers seeking to protect their work.

Despite these challenges, fashion brands and designers continue to explore new ways to protect their work. Some are leveraging social media to publicly call out infringers, using consumer support and brand reputation as tools for enforcement. Others are investing in digital authentication methods, such as blockchain technology, to establish proof of ownership and prevent counterfeiting. The legal landscape surrounding industrial design rights in fashion remains in flux, and while existing frameworks provide some level of protection, they must evolve to address the realities of the modern fashion industry. Strengthening enforcement mechanisms, increasing international cooperation, and

³³³ *Chanel v. What Goes Around Comes Around*, (2023) Inc 19 US 734 (USA).

³³⁴ Bently, Lionel & Brad Sherman, *Intellectual Property Law* 245-267 (Oxford University Press, 5th ed., 2018).



embracing technological advancements will be key to ensuring that fashion designers can safeguard their creative work in an industry that thrives on both innovation and imitation.³³⁵

FUTURE OF INDUSTRIAL DESIGN PROTECTION IN FASHION

The future of industrial design protection in the fashion industry will be shaped by evolving legal frameworks, technological advancements, and changing business models. As the fashion industry continues to expand globally, the need for stronger and more harmonized intellectual property laws has become more evident. One major proposal is extending the duration of design protection, which is currently limited in most jurisdictions, often lasting only 10 to 25 years. Since fashion trends evolve rapidly, many designs fall into the public domain before brands can fully capitalize on them. A longer protection period could help designers maintain exclusive rights for a reasonable duration while ensuring that fashion remains a dynamic and innovative industry. Additionally, efforts to harmonize global design laws would reduce jurisdictional inconsistencies, making it easier for designers to protect their work internationally.³³⁶ With variations in enforcement levels across different regions, a unified system, potentially through the expansion of the Hague Agreement or stronger enforcement mechanisms under TRIPS, could ensure more consistent protection against design theft across borders.³³⁷

New business models and licensing strategies are also reshaping how fashion brands approach industrial design protection. Rather than relying solely on litigation, many companies are turning to licensing agreements to maintain control over their designs while allowing for broader commercial use. This strategy is particularly evident in the growing trend of luxury brands collaborating with fast fashion retailers. High-end designers such as Versace, Karl Lagerfeld, and Balmain have partnered with brands like H&M and Zara to create limited-edition collections, ensuring that their designs are legally accessible at lower price points rather than being illegally copied by fast fashion companies. These collaborations provide financial benefits to both parties while reducing the incentive for fast fashion brands to engage in outright infringement.³³⁸

³³⁵ Aaron & Jason Schultz, *The End of Ownership: Personal Property in the Digital Economy* 189-210 (MIT Press, 2016).

³³⁶ Jacques, *Design Law: European and International Perspectives* 57-84 (Edward Elgar Publishing, 2013).

³³⁷ Mark P., *Dressing the Part: A History of Fashion Copyright*, *Notre Dame Law Review*, Vol. 93, No. 4, 1291-1325 (2018).

³³⁸ Susan, *Who Owns Culture? Appropriation and Authenticity in American Law* 98-125 (Rutgers University Press, 2005).



Potential IP law reforms could further shape the future of fashion design protection, particularly in areas where existing laws fall short. One of the most debated reforms is the expansion of copyright protection to fashion designs. Unlike trademarks and patents, copyright generally does not protect clothing and accessories unless they exhibit a high degree of artistic expression. Given the increasing focus on sustainability, some experts suggest that designers who develop environmentally friendly materials or production methods should be required to license their innovations at reasonable rates, ensuring that sustainability efforts benefit the entire industry rather than being monopolized by a few large corporations. This model has been applied in other industries, such as pharmaceuticals, and could provide a balanced approach to encouraging both innovation and accessibility in fashion. Following is the comparison chart **of Industrial Design Protection across Major Jurisdictions:**

Table 1: Comparison of Industrial Design Protection across Major Jurisdictions

Country/Region	Law Governing Design Protection	Duration of Protection	Key Challenges
USA	Design Patents (USPTO)	15 years	High cost, lengthy process
EU	Community Design (EUIPO)	5-25 years [(registered), (Initially valid for 5 years from the filing date and can be renewed for 5-year periods, up to a maximum of 25 years.)] / 3 years (unregistered)	Limited unregistered design protection
India	Designs Act, 2000	15 years (Initially granted for 10 years from the date of registration, later can be extended by an additional 5 years upon renewal application)	Slow enforcement, weak litigation support
China	Patent Law of China	15 years	Counterfeiting, weak IP enforcement



Country/Region	Law Governing Design Protection	Duration of Protection	Key Challenges
UK	Registered Designs Act, 1949	25 years (registered) / 15 years (unregistered).	Fast fashion loopholes

Consumer awareness is also emerging as a crucial factor in reducing design theft. With the rise of ethical consumer movements, buyers are becoming more conscious of where and how their clothing is made. Many consumers now prefer to purchase from brands that prioritize originality, sustainability, and fair labor practices, rather than supporting companies known for copying designs or engaging in exploitative manufacturing. Some brands have taken proactive steps to educate customers about the risks of counterfeiting, using campaigns to highlight the negative impact of fake fashion on both the original designers and the workers involved in counterfeit production. Luxury brands, in particular, have emphasized the craftsmanship and exclusivity of their products, reinforcing the idea that genuine designs hold greater value than imitations.³³⁹ Social media has played a key role in these efforts, as fashion brands use platforms like Instagram and TikTok to engage with consumers, share their design processes, and expose instances of plagiarism. As consumers become more informed, their purchasing decisions may act as a deterrent to design infringement, shifting the industry toward greater respect for original creations.³⁴⁰

In the coming years, the protection of industrial designs in fashion will depend on a combination of legal, technological, and market-driven solutions. Strengthening existing laws, leveraging advanced enforcement tools, and adopting innovative business models will be essential to safeguarding designers' rights in an industry known for rapid trend cycles and constant reinvention. While challenges remain, the growing recognition of intellectual property issues in fashion, along with increased collaboration between designers, brands, and consumers, suggests that the future of design protection will be more comprehensive and adaptable to the evolving landscape of the fashion industry.³⁴¹

³³⁹ Jacques, *Design Law: European and International Perspectives* 57-84 (Edward Elgar Publishing, 2013).

³⁴⁰ Raustiala, Kal & Christopher Sprigman, *The Piracy Paradox: Innovation and Intellectual Property in Fashion Design*, Virginia Law Review, Vol. 92, No. 8, 1687-1777 (2006).

³⁴¹ Mark P., *Dressing the Part: A History of Fashion Copyright*, Notre Dame Law Review, Vol. 93, No. 4, 1291-1325 (2018).



POLICY RECOMMENDATIONS FOR STRENGTHENING INDUSTRIAL DESIGN PROTECTION

Strengthening industrial design protection in the fashion industry requires a multi-faceted approach that combines legal reforms, global cooperation, technological advancements, and industry-driven initiatives. One of the primary areas in need of reform is the registration and enforcement mechanisms for industrial designs. Currently, the design registration process in many jurisdictions is complex, time-consuming, and costly, making it difficult for small and independent designers to secure legal protection³⁴² for their creations. Simplifying the application process by reducing paperwork, implementing digital filing systems, and ensuring faster approvals can significantly enhance accessibility. Additionally, reducing registration and renewal fees for small businesses and individual designers would encourage broader participation in the formal IP system.³⁴³ Beyond national legal reforms, strengthening international cooperation is essential for effectively protecting industrial designs in the globalized fashion market. The rise of digital commerce and cross-border trade has made it increasingly difficult to tackle design infringement within a single jurisdiction. International treaties such as the Hague Agreement and the TRIPS Agreement provide some level of harmonization, but enforcement mechanisms remain inconsistent across different regions. There is a pressing need for stronger cross-border collaboration between legal authorities, customs agencies, and IP offices to track and prevent the circulation of counterfeit and copied designs.

The World Intellectual Property Organization (WIPO) can play a pivotal role in facilitating this cooperation by establishing standardized guidelines, organizing joint enforcement initiatives, and promoting knowledge-sharing among nations. Additionally, bilateral agreements between key fashion-producing and consuming nations, such as those between the US, EU, India, and China, can improve mutual recognition of design rights and enhance enforcement efforts. A globally coordinated approach will help reduce jurisdictional loopholes that infringers exploit and create a more consistent legal environment for protecting fashion designs.

Counterfeiting remains one of the biggest threats to industrial design protection in fashion, necessitating stronger anti-counterfeiting measures. Technological advancements offer promising solutions for combating counterfeit products, particularly through AI-driven detection and

³⁴² Jacques, *Design Law: European and International Perspectives*, 57-84 (Edward Elgar Publishing, 2013).

³⁴³ Susan, *Who Owns Culture? Appropriation and Authenticity in American Law*, 98-125 (Rutgers University Press, 2005).



blockchain-based authentication systems. AI-powered image recognition tools can identify infringing designs by scanning vast amounts of online content, while blockchain technology allows brands to create immutable digital records verifying the authenticity of their designs. These tools can be integrated into e-commerce platforms, enabling real-time monitoring and takedown of counterfeit listings. However, the role of online marketplaces in addressing counterfeiting must also be strengthened through stricter regulations. Major e-commerce platforms such as Amazon, Alibaba, and Taobao have been criticized for not doing enough to prevent the sale of fake fashion items. Policies requiring these platforms to conduct proactive monitoring, implement stricter seller verification processes, and provide transparent reporting on IP infringement cases would significantly reduce the availability of counterfeit fashion products. Holding platforms accountable for counterfeit sales through legal frameworks and financial penalties would further incentivize them to strengthen their enforcement mechanisms.³⁴⁴

The European Union has also seen landmark cases, such as *Karen Millen Fashions v. Dunnes Stores* (2014)³⁴⁵. In this case, Karen Millen sued Dunnes Stores for copying its blouse and knitwear designs. The European Court of Justice (ECJ) ruled in favor of Karen Millen, reinforcing the protection offered by unregistered Community designs under EU law. While legal reforms and enforcement mechanisms are crucial, industry self-regulation also plays a vital role in strengthening industrial design protection. Fashion law associations, such as the International Trademark Association (INTA) and the Council of Fashion Designers of America (CFDA), can help set industry-wide standards for IP protection and guide designers in navigating legal complexities. These associations can develop best practices for design registration, infringement monitoring, and ethical licensing frameworks. For instance, independent designers could be given the option to license their designs to major retailers under fair terms rather than facing unauthorized replication. Industry self-regulation can also help foster a culture of respect for original design work, reducing the reliance on litigation as the primary means of protection.³⁴⁶

Strengthening industrial design protection in fashion requires a comprehensive strategy that balances legal, technological, and industry-led solutions. Simplifying the design registration process and improving enforcement mechanisms will make legal protection more accessible and effective. By

³⁴⁴ Mark P., *Dressing the Part: A History of Fashion Copyright*, Notre Dame Law Review, Vol. 93, No. 4, 1291-1325 (2018).

³⁴⁵ *Karen Millen Fashions v. Dunnes Stores*, (2014) Case C-345/13 (EU).

³⁴⁶ *Supra* n. 29.



implementing these policy recommendations, the fashion industry can better protect its creative assets while continuing to evolve and adapt to new challenges.³⁴⁷

CASE LAWS AND CASE STUDIES

Legal battles over fashion designs have shaped the landscape of intellectual property rights in the industry. Courts worldwide have dealt with disputes over silhouettes, patterns, and aesthetic elements, highlighting the challenges of enforcing industrial design rights. Some cases have reinforced the importance of protection, while others have exposed gaps in the legal framework. One landmark case is *Louboutin v. Yves Saint Laurent (2012)*³⁴⁸, where Christian Louboutin sued YSL for selling shoes with a red sole, arguing it infringed his trademark. The US Court of Appeals ruled that Louboutin's red sole was a distinctive trademark but only protected when used in contrast with other shoe colors. This case emphasized the challenges of distinguishing between industrial design, trademark, and functional design elements. Another significant case is *Star Athletica v. Varsity Brands (2017)*³⁴⁹, where the US Supreme Court ruled on whether cheerleading uniform designs were copyrightable. The Court held that aesthetic features of a design could be protected under copyright law if they were separable from the useful function of the clothing. This case influenced how fashion designs are assessed for copyright protection and blurred the boundaries between copyright and industrial design rights.

In *Gucci v. Forever 21 (2018)*³⁵⁰, Gucci sued Forever 21 for copying its iconic blue-red-blue and green-red-green stripe designs. Forever 21 argued that these stripes were too generic to be protected under trademark or industrial design laws. The case ultimately led to a settlement, but it highlighted the difficulties in proving distinctiveness and ownership over commonly used fashion elements.³⁵¹

The debate over whether functional designs should receive protection was evident in *Crocs v. USA ITC (2021)*³⁵². Crocs sued several companies for copying its iconic clog design, claiming protection under industrial design rights. The US International Trade Commission ruled that the design was distinctive and infringed upon Crocs' IP. This case demonstrated how industrial design protection can apply to widely recognized products, even those with functional elements.

³⁴⁷ Margoni, Thomas, *The Protection of Fashion Design in the UK and EU: The Challenges of Copyright and Design Rights*, Queen Mary Journal of Intellectual Property, 74-96 Vol. 6, No. 1, (2016).

³⁴⁸ *Louboutin v. Yves Saint Laurent*, (2012) No. 11-3303 (2d Cir. 2012) (US).

³⁴⁹ *Star Athletica v. Varsity Brands*, (2017) 580 U.S. 405 (2017) (US).

³⁵⁰ *Gucci v. Forever 21*, (2018) Inc 2018 US 492 (US).

³⁵¹ Mark P., *Dressing the Part: A History of Fashion Copyright*, Notre Dame Law Review, Vol. 93, No. 4, 1291-1325 (2018).

³⁵² *Crocs v. USA ITC*, (2021)19 US 1337(a)(1)(A) (US).



Fast fashion companies frequently face design infringement claims, as seen in *Adidas v. Skechers* (2016).³⁵³ Adidas sued Skechers for allegedly copying its three-stripe design and a sneaker resembling its Stan Smith model. The court granted an injunction against Skechers, recognizing Adidas' trade dress and design rights. This case emphasized the role of trade dress protection in fashion and its overlap with industrial design rights.³⁵⁴ These cases illustrate the evolving nature of industrial design protection in fashion, influenced by globalization, technology, and changing consumer trends. They highlight the complexities of distinguishing between design protection, copyright, and trademarks while demonstrating the importance of enforcing IP rights to protect innovation in the fashion industry.

CONCLUSION

The protection of industrial designs in the fashion industry is a critical yet complex issue that continues to evolve with the changing dynamics of global markets, technological advancements, and shifting consumer behaviors. Fashion, by its very nature, thrives on creativity and rapid reinvention, yet it also suffers from widespread design infringement, counterfeiting, and legal ambiguities that make effective intellectual property protection challenging. While existing industrial design laws provide a framework for safeguarding unique creations, they often fall short due to the short duration of protection, costly enforcement mechanisms, and jurisdictional inconsistencies. The emergence of fast fashion, AI-generated designs, blockchain-based authentication, and sustainable fashion trends further complicate the landscape, requiring a more adaptive and forward-thinking approach to legal protection. The rise of digital technology and artificial intelligence is another transformative factor reshaping industrial design protection in fashion. AI tools can now generate fashion designs, raising critical questions about ownership, originality, and legal recognition. Traditional IP frameworks, which are largely built around human creativity, struggle to accommodate AI-generated works, creating a legal gray area that needs urgent attention. Moreover, AI-driven image recognition and blockchain-based authentication present significant opportunities for strengthening enforcement efforts.



³⁵³ *Adidas v. Skechers*, (2016) No. 16-35204 (9th Cir. 2018) (US).

³⁵⁴ Susan, *Who Owns Culture? Appropriation and Authenticity in American Law* 98-125 (Rutgers University Press, 2005).



CHAPTER 12

RECALIBRATING FRAND LICENSING: BALANCING MARKET FAIRNESS AND INNOVATION IN THE GLOBAL SEP LANDSCAPE

- Neha Bhuraney*

ABSTRACT

The principle of Fair, Reasonable, and Non-Discriminatory (FRAND) licensing lies at the heart of Standard Essential Patent (SEP) governance, yet its practical application remains one of the most congested areas in global intellectual property law. This paper addresses the research question: How can FRAND licensing frameworks be recalibrated to ensure equitable access to SEPs without undermining innovation and investment incentives? The study adopts a comparative legal methodology, examining the implementation of FRAND obligations in key jurisdictions including the United States, European Union, China, and India. Through a critical analysis of leading SEP licensing disputes such as Huawei v. ZTE, Unwired Planet v. Huawei, and Ericsson v. Xiaomi the paper identifies divergent judicial approaches to royalty-setting, non-discrimination standards, and the role of good faith negotiation. Particular emphasis is placed on how developing economies face challenges in accessing SEPs due to asymmetries in bargaining power, lack of transparent licensing norms, and barriers to indigenous innovation. The paper further investigates the intersection of FRAND and competition law, highlighting how misuse of SEPs through patent hold-up or refusal to license can distort fair market access. It proposes a hybrid framework of voluntary licensing registries, publicly auditable royalty benchmarks, and cross-border dispute resolution mechanisms under international supervision (e.g., WTO or WIPO panels). This research is especially relevant to the conference's theme on market fairness, as it bridges the gap between IP exclusivity and inclusive technological growth.

KEYWORDS: FRAND, Standard Essential Patents (SEPs), Patent Hold-up and Hold-out, Comparative IP Law, Technology Access and Equity

INTRODUCTION

In the modern digital economy, Standard Essential Patents (SEPs) occupy a uniquely influential position. These patents protect technologies that are indispensable for complying with established

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industry standards be it in telecommunications, the Internet of Things (IoT), artificial intelligence, or next-generation connectivity infrastructures such as 5G.³⁵⁵ The value of SEPs lies not merely in their technical novelty but in their systemic necessity. Any manufacturer seeking to implement a standardized technology must access the relevant SEPs, making them critical assets in global technology markets.

Given their centrality, the licensing of SEPs must be governed by a framework that both incentivizes innovation and ensures equitable access. This is where the FRAND (Fair, Reasonable, and Non-Discriminatory) licensing principle comes into play. Originating from the practices of Standard Setting Organizations (SSOs), FRAND obligations are designed to prevent the misuse of market power by SEP holders. They seek to create a balance wherein patent holders are adequately compensated for their investments, while implementers can access the technology without prohibitive costs or anti-competitive barriers.³⁵⁶

However, despite its widespread acceptance in theory, the practical implementation of FRAND licensing has become one of the most contentious and ambiguous areas in global intellectual property (IP) law. Courts, regulators, and litigants continue to grapple with questions such as: What constitutes a “fair” royalty? When does a licensing offer cross the threshold of being “unreasonable”? What behaviors qualify as “discriminatory” under FRAND norms? These unresolved questions have led to significant divergence in judicial decisions, regulatory standards, and commercial practices across jurisdictions.³⁵⁷ At the heart of the issue is a deeper conceptual tension: How can legal and policy frameworks promote inclusive access to essential technologies without disincentivizing the very innovation they seek to disseminate? This tension is particularly stark in the context of developing economies, where technological access is often constrained by licensing costs, power imbalances, and weak regulatory capacities.

This paper addresses these complex challenges by exploring the research question: How can FRAND licensing frameworks be recalibrated to ensure equitable access to SEPs without

³⁵⁵ Igor Nikolic, *Licensing Standard Essential Patents: FRAND and the Internet of Things* (Hart Publ’g 2021), <https://hdl.handle.net/1814/73601>.

³⁵⁶ Jorge L. Contreras, Chapter 20 – Technical Standards: Fair, Reasonable and Non-Discriminatory (FRAND) Licensing, in *Intellectual Property Licensing and Transactions* (2020), <https://dc.law.utah.edu/scholarship/225/>

³⁵⁷ Biswajit Dhar & Reji Joseph, Standard Essential Patents and FRAND Licensing, in *Equitable Access to Innovation: IP Policy and the Global South* (Routledge 2021), <https://www.taylorfrancis.com/chapters/edit/10.4324/9781003000259-12/standard-essential-patents-frand-licensing-biswajit-dhar-reji-joseph>.



undermining innovation and investment incentives? To answer this, the study adopts a comparative legal methodology, analyzing how different jurisdictions have approached the interpretation and enforcement of FRAND obligations. The comparative framework focuses on four key jurisdictions:

- The United States, known for its strong IP enforcement regime and contract-based interpretation of FRAND;
- The European Union, which integrates competition law more explicitly into FRAND adjudication;
- China, whose recent jurisprudence reflects its strategic positioning between technology consumer and emerging innovator; and
- India, where SEP law remains underdeveloped but carries profound implications for equitable digital access in the Global South.

By examining seminal disputes such as *Huawei v. ZTE* (EU)³⁵⁸, *Unwired Planet v. Huawei*³⁵⁹ (UK), *Ericsson v. Xiaomi*³⁶⁰ (India), and *Huawei v. Conversant*³⁶¹ (China), the paper identifies not only judicial inconsistencies but also evolving patterns of negotiation, enforcement, and royalty-setting. It pays special attention to how courts have engaged with complex issues such as injunctive relief, global licensing practices, royalty base calculations, and the role of good faith negotiations in the SEP licensing process.

A key finding that emerges from this comparative analysis is that no single jurisdiction has successfully harmonized the multiple objectives of the FRAND regime. The absence of universally accepted guidelines and the lack of a central institutional authority leave SEP licensing vulnerable to strategic manipulation, including patent hold-up (where patent holders exploit their market position) and patent hold-out (where implementers avoid licensing obligations through delay or refusal).³⁶²

Moreover, the paper emphasizes the particular vulnerability of developing countries in this landscape. As these economies seek to integrate into global value chains and develop indigenous innovation capabilities, they face a host of barriers: lack of transparency in licensing practices, high transaction

³⁵⁸ *Huawei Techs. Co. v. ZTE Corp.*, Case C-170/13, ECLI:EU:C:2015:477.

³⁵⁹ *Unwired Planet Int'l Ltd. v. Huawei Techs. Co.*, [2020] UKSC 37.

³⁶⁰ 3074 of 2015 in CS(OS)

³⁶¹ UKSC 2019/0041

³⁶² 'Standard-Setting Organizations and FRAND Licensing, in *Competition Policy and Intellectual Property in Today's Global Economy* 211 (Thomas Cheng, Ioannis Lianos & D. Daniel Sokol eds., Cambridge Univ. Press 2021), <https://www.cambridge.org/core/books/competition-policy-and-intellectual-property-in-todays-global-economy/standardsetting-organizations-and-frand-licensing/71B6B037DB48ADBE141838957DFDC268>.



costs, asymmetrical bargaining positions, and limited representation in international standard-setting processes. This results in a de facto exclusion from the full benefits of standardized technology, stifling both economic participation and digital equity.

In response, the paper proposes a recalibrated FRAND framework grounded in three interlocking principles: transparency, accountability, and inclusivity. Specifically, it recommends the creation of voluntary licensing registries maintained by SSOs, the adoption of publicly auditable royalty benchmarks, and the establishment of cross-border dispute resolution mechanisms potentially under the auspices of multilateral institutions such as the World Intellectual Property Organization (WIPO) or the World Trade Organization (WTO).³⁶³

By placing a normative spotlight on the intersection of innovation, competition, and access, this research contributes to a growing global discourse on how intellectual property regimes can be restructured to serve both market efficiency and social justice. Ultimately, a recalibrated FRAND licensing framework must not only preserve the incentives necessary for technological advancement but also ensure that these advancements are equitably distributed and sustainably governed, especially in regions where innovation is not just an aspiration but a developmental necessity.

THEORETICAL FRAMEWORK: FRAND, SEPS, AND MARKET FAIRNESS

Defining SEPs and the FRAND Commitment

In the digital economy, innovation and standardization often go hand in hand. The proliferation of interconnected devices, global communications infrastructure, and smart technologies depends on the use of technical standards rules or protocols established to ensure compatibility, interoperability, and functionality across products and systems. These standards are not merely guidelines; they form the technological backbone of global markets.³⁶⁴ Compliance with these standards is, in many cases, mandatory for firms seeking to participate in competitive markets such as telecommunications, automotive systems, and consumer electronics.

Enter Standard Essential Patents (SEPs) patents that protect technologies without which it would be impossible to comply with these standards. By definition, SEPs grant their holders exclusive rights

³⁶³ Supra Note 1

³⁶⁴ G. Ghidini, Calculating FRAND Licensing Fees: A Proposal of Basic Rules, in *Intellectual Property and Competition Law* 57 (Springer 2017), https://link.springer.com/chapter/10.1007/978-981-10-6011-3_4.



over essential technological functions. This confers considerable market leverage on SEP holders, often leading to complex legal and economic challenges. The core issue is that the essentiality of the patented technology leaves implementers with no viable alternative: to produce a compliant product, one must necessarily use the patented technology.

Such structural compulsion gives rise to the potential for anti-competitive behaviour. Two major concerns frequently arise:³⁶⁵

1. Patent hold-up, where SEP holders exploit their strategic position to demand unreasonably high royalties or seek injunctive relief, thereby delaying market entry and stifling downstream innovation.
2. Refusal to license, where SEP holders deny licenses selectively, creating barriers to entry for competitors or extracting monopolistic rents.

To mitigate these risks and maintain a functional balance between intellectual property rights and public access, Standard Setting Organizations (SSOs) typically require patent holders to commit to licensing their SEPs on Fair, Reasonable, and Non-Discriminatory (FRAND) terms. This commitment forms the conceptual cornerstone of modern SEP governance.

The FRAND obligation is intended to serve three interlinked goals:

- Fairness: ensuring that all potential licensees are treated equitably and that no single implementer is unduly advantaged or excluded.
- Reasonableness: preventing the imposition of exorbitant royalties that would make implementation economically unviable.
- Non-discrimination: guaranteeing that similarly situated licensees receive similar licensing terms, thus upholding competitive neutrality in the market.

While conceptually sound, the practical interpretation of FRAND terms remains deeply contested. There is no universally accepted legal or economic definition of what constitutes "fair," "reasonable," or "non-discriminatory." As a result, different courts and jurisdictions adopt varying benchmarks, leading to judicial fragmentation and inconsistent outcomes. For instance, royalty rates deemed reasonable in one jurisdiction may be considered excessive in another. This legal pluralism creates

³⁶⁵ E. Habich, Perspectives from the FRAND Licensing of Standard-Essential Patents to the Data Act, 53 *IIC – Int'l Rev. Intell. Prop. & Competition L.* 1316 (2022), <https://link.springer.com/article/10.1007/s40319-022-01255-x>.



negotiation deadlocks, forum shopping, and compliance uncertainty, undermining the very predictability that standards are supposed to provide.³⁶⁶

Moreover, the FRAND commitment is contractual in nature it arises from agreements between SEP holders and SSOs, not from statutory obligations. This often complicates enforcement, particularly when disputes cross borders or involve parties not directly subject to the SSO's jurisdiction.

Market Fairness and the Innovation–Investment Trade-off

At its core, FRAND licensing is about balance—a dynamic equilibrium between two imperatives:

- the need to reward innovation, and
- the necessity of ensuring fair market access to technologies embedded in industry standards.

On one side, SEP holders are often firms that have invested heavily in research and development. Granting them exclusivity and adequate returns is essential to incentivize innovation, foster technological progress, and maintain the integrity of the patent system. If FRAND obligations are enforced too stringently or interpreted too restrictively, there is a risk that patent holders will be disincentivized from contributing their innovations to the standard-setting process. This could lead to fragmented standards, redundant innovation, and ultimately a slowdown in technological diffusion.³⁶⁷

On the other side, implementers especially those in developing economies require affordable and predictable access to SEPs in order to bring their products to market. Excessive royalty burdens or discriminatory licensing practices can limit participation, raise consumer prices, and entrench technological inequality. In this context, access to standardized technologies becomes not just a commercial issue, but a matter of economic justice and developmental equity.

The challenge is exacerbated in the Global South, where asymmetries in bargaining power, legal capacity, and technical information are particularly pronounced. Firms in these countries often lack the resources to engage in prolonged negotiations or litigation over licensing terms. Furthermore, the opacity of existing licensing agreements many of which are kept confidential makes it difficult for smaller firms to benchmark reasonable rates or negotiate from a position of knowledge.

This raises a critical policy question: Can the current FRAND framework be reconciled with the broader goal of inclusive innovation? If the licensing regime disproportionately favors large

³⁶⁶ Standard Essential Patents and FRAND Licensing: The Evolution of the European Approach, in *Standard-Essential Patents, FRAND and the Internet of Things* 113 (Igor Nikolic ed., Oxford Univ. Press 2021), <https://academic.oup.com/book/46572/chapter/408282982>.

³⁶⁷ Lorenz Brachtendorf et al., Truly Standard-Essential Patents? A Semantics-Based Analysis, *J. Econ. & Mgmt. Strategy* (2023), <https://onlinelibrary.wiley.com/doi/10.1111/jems.12500>.



multinational SEP holders at the expense of smaller implementers and emerging economies, then the FRAND framework risks becoming a barrier to technological democratization. Worse, it may exacerbate existing digital divides and hinder the ability of less-developed countries to participate in the Fourth Industrial Revolution.

Thus, recalibrating the FRAND licensing architecture must involve re-envisioning the terms of market fairness. It is no longer sufficient to see FRAND obligations merely as private contractual terms between technology owners and users. Rather, they must be viewed through the lens of global economic governance, where access, accountability, and innovation are seen as mutually reinforcing goals. Only by acknowledging and addressing the deep-rooted inequities in SEP licensing can we move toward a regime that truly balances private rights with public goods.³⁶⁸

COMPARATIVE APPROACHES TO FRAND ENFORCEMENT

The global landscape of FRAND enforcement reveals diverse legal and institutional responses to the challenge of balancing innovation incentives with access to standardized technologies. While the commitment to FRAND licensing is generally accepted in principle, the manner in which it is interpreted and enforced varies significantly across jurisdictions. This section examines the regulatory and judicial approaches to FRAND licensing in four key jurisdictions the United States, the European Union, China, and India each embodying different ideological, economic, and legal traditions that shape their response to SEP governance.³⁶⁹

UNITED STATES: STRONG IP ENFORCEMENT AND PATENT ASSERTION

The United States has historically emphasized the sanctity of patent rights and the enforcement of contractual commitments. Within this framework, FRAND obligations are predominantly treated as private contractual duties, arising from the commitments SEP holders make to Standard Setting Organizations (SSOs). U.S. courts do not view FRAND as a standalone statutory obligation; instead, they adjudicate SEP disputes through the lens of contract law, tort law, and antitrust principles, depending on the context.

A landmark decision in this regard is *Microsoft Corp. v. Motorola, Inc.* (2013), in which the U.S. District Court for the Western District of Washington adopted a modified Georgia-Pacific framework

³⁶⁸ G.A. Gabison, *Worldwide FRAND Licensing Standard*, 8 *Am. U. Bus. L. Rev.* 337 (2019), <https://digitalcommons.wcl.american.edu/cgi/viewcontent.cgi?article=>.

³⁶⁹ *Supra* Note 3



to assess what constitutes a reasonable royalty. The court recognized the need for royalty rates that reflect the value of the patented technology within the context of the standard, as opposed to the ex post bargaining position of the patent holder. The judgment set an important precedent by judicially quantifying FRAND commitments and affirming that damages for breach of FRAND obligations can be substantial.³⁷⁰

In SEP litigation, U.S. courts have generally shown reluctance to grant injunctive relief unless there is clear evidence of bad-faith conduct by the licensee, such as willful infringement or refusal to negotiate. This approach was reinforced in *Apple Inc. v. Motorola, Inc.*, where the court underscored the public interest in avoiding injunctions that could disrupt access to widely used technologies embedded in industry standards.

However, despite this judicial moderation, regulatory tensions persist. The Federal Trade Commission (FTC) and Department of Justice (DOJ) have issued differing views on the antitrust implications of SEP enforcement. While the FTC has warned against SEP misuse leading to “patent hold-up,” the DOJ under certain administrations has expressed concern that overly aggressive antitrust enforcement might disincentivize legitimate innovation. These contrasting positions highlight the fragile policy balance between protecting IP rights and preventing market abuse.³⁷¹

European Union: Emphasis on Proportionality and Competition

In contrast to the U.S., the European Union places significant emphasis on competition law in the interpretation of FRAND obligations. The EU’s approach is informed by its broader legal philosophy that market power, even when legally obtained through IP rights, must not be exercised in a way that distorts competition or harms consumers.³⁷² The most influential case in this domain is *Huawei Technologies Co. Ltd v. ZTE Corp.* (CJEU, 2015). The Court of Justice of the European Union (CJEU) laid out a structured framework for good-faith FRAND negotiations, delineating the obligations of both SEP holders and potential licensees. The court held that SEP holders who seek injunctions may, under certain circumstances, abuse their dominant position under Article 102 of the Treaty on the Functioning of the European Union (TFEU).

³⁷⁰ Enrico Bonadio & Shreya Sampathkumar, Mapping the Indian Case Law on Standard Essential Patents (2024) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4838382.

³⁷¹ M. Dolmans, FRAND Licensing Commitments – Back to First Principles (2021) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3872755.

³⁷² Ilaria Gatti, Standard Essential Patents and Competition: How the New Antitrust Approach Could Affect the IoT Industry, 12 *Eur. J.L. & Tech.* (2021), <https://ejlt.org/index.php/ejlt/article/view/768>.



According to the Huawei/ZTE protocol, a SEP holder must alert the alleged infringer of the infringement and make a written FRAND offer. The licensee, in turn, must respond diligently, either by accepting the offer or making a counter-offer. If either party deviates from this negotiation protocol, they risk losing legal protection either against injunctions (in the case of SEP holders) or against infringement claims (for licensees).³⁷³ This proportionality-based approach attempts to reduce the risk of both patent hold-up and hold-out, aiming to create a balanced incentive structure that rewards innovation while maintaining open access. Moreover, the European Commission has actively investigated potential SEP abuses under its antitrust authority, further reinforcing the region's commitment to market fairness in standard-based innovation.

China: Balancing Access and Sovereignty

China's engagement with FRAND licensing reflects its evolving role as both a major technology importer and an emergent innovator. In recent years, Chinese courts have demonstrated increasing sophistication in adjudicating SEP disputes, with a distinct emphasis on judicial pragmatism and national interest.

Two key developments underscore China's approach. First, its courts have become more assertive in setting global royalty rates, as seen in *Huawei v. Conversant* and *Xiaomi v. InterDigital*, where Chinese courts issued royalty assessments that were intended to be binding globally. Second, Chinese courts have used Anti-Suit Injunctions (ASIs) as a strategic tool to pre-empt parallel proceedings in foreign jurisdictions. While ASIs have drawn criticism from some quarters for overreach, they also reflect China's growing judicial assertiveness in IP matters.³⁷⁴

China's regulators have also entered the fray. The State Administration for Market Regulation (SAMR) has begun investigating potentially anti-competitive SEP practices under the Anti-Monopoly Law (AML). The AML provides a framework to challenge abuse of dominance, including excessive pricing or refusal to license, thereby complementing judicial oversight.³⁷⁵ Overall, China's SEP regime seeks to strike a balance between aligning with international IP norms and protecting domestic technological

³⁷³ European Commission SEP Expert Group, *SEP Licensing in the IoT, dIPlEx* (2023), <https://profwurzner.com/the-internet-of-things-meets-sep-licensing/>.

³⁷⁴ *InterDigital Inc., Fair, Reasonable, and Non-Discriminatory Licensing of Standard-Essential Patents* (2022), https://www.interdigital.com/download/25106/interdigital_franc_whitepaper.

³⁷⁵ *Supra* Note 5



sovereignty. As China advances its own standardization agenda (e.g., in 5G and AI), its courts are likely to play an even more pivotal role in shaping the global contours of FRAND enforcement.

India: Nascent SEP Jurisprudence and Regulatory Gaps

India's experience with SEP enforcement is relatively recent, yet its implications are significant, especially given the country's large manufacturing base and digital aspirations. Indian courts have presided over several important SEP disputes, including *Ericsson v. Micromax*, *Ericsson v. Intex*, and *Ericsson v. Xiaomi*. These cases reveal key structural weaknesses: lack of clear judicial guidelines on FRAND royalty calculation, absence of statutory provisions specifically addressing SEPs, and inconsistencies in interim relief measures.

The Competition Commission of India (CCI) has attempted to step into this regulatory vacuum. It launched investigations into Ericsson's SEP licensing practices, examining allegations of discriminatory and excessive royalty demands. However, jurisdictional tensions between the CCI and the judiciary (notably the Delhi High Court) have hindered a coherent enforcement trajectory.³⁷⁶ India's Patents Act, 1970, does not contain provisions tailored to SEP licensing or FRAND obligations. As a result, courts have had to rely on general principles of contract and equity, leading to doctrinal uncertainty. This legal underdevelopment poses a particular challenge for small and medium enterprises (SMEs), which lack the bargaining power to negotiate or litigate SEP licenses effectively. Given India's strategic role in the global South and its ambitions to become a digital manufacturing hub, the development of a transparent, balanced, and predictable SEP regime is essential. Future reforms may include legislative amendments, guidance from SSOs, and stronger international collaboration.

CHALLENGES IN THE GLOBAL SEP LICENSING LANDSCAPE

Despite the foundational promise of FRAND licensing to facilitate balanced access to standardized technologies, the global SEP regime continues to be marked by persistent structural and procedural challenges. These obstacles not only hamper legal consistency but also threaten the broader goals of equitable technology access and sustainable innovation. Three core challenges—divergent royalty methodologies, bargaining power asymmetries, and lack of transparency—stand out as particularly urgent.

³⁷⁶ Marks & Clerk, *Mastering SEP Licensing and the FRAND Framework* (2025), <https://www.marks-clerk.com/insights/latest-insights/102k6we-mastering-sep-licensing-and-the-frand-framework/>.



Divergence in Royalty Determination

One of the most significant issues in global SEP enforcement is the lack of a harmonized methodology for determining FRAND-compliant royalty rates. Courts and regulatory bodies across jurisdictions have adopted distinct approaches, leading to inconsistent outcomes. For instance, the UK High Court in *Unwired Planet v. Huawei*³⁷⁷ favoured the top-down approach, where the total royalty burden for all SEPs in a standard is calculated first and then apportioned among SEP holders. In contrast, the U.S. courts, particularly in *Ericsson v. D-Link*³⁷⁸, have leaned toward the incremental value approach, which assesses the value of the patented technology over and above existing alternatives.

These differing methodologies lead to substantial variation in royalty assessments, creating legal uncertainty and encouraging forum shopping. SEP holders may strategically select jurisdictions favourable to higher royalty outcomes or more lenient enforcement, while implementers may seek to litigate in venues with lower thresholds for FRAND compliance. This fragmented landscape undermines predictability and increases the transactional costs of licensing, especially in cross-border disputes.³⁷⁹

Bargaining Power Asymmetries

The SEP licensing ecosystem is often characterized by asymmetric power dynamics, particularly between large multinational patent holders and smaller firms or entities in developing countries. Many technology implementers in the Global South face significant disadvantages, including limited legal and negotiating capacity, lack of access to patent pool information, and resource constraints. These disparities restrict their ability to secure licenses on truly FRAND terms and pose a direct barrier to affordable technological integration, particularly in sectors such as mobile telecommunications, digital healthcare, and 5G infrastructure development.

Lack of Transparency and Licensing Norms

A recurring criticism of the SEP licensing regime is its opacity. Licensing agreements are often settled confidentially, with little public disclosure of royalty rates or the terms of negotiation. Additionally, incomplete or inaccurate SEP declarations submitted to SSOs exacerbate the problem, making it

³⁷⁷ [2020] UKSC 37

³⁷⁸ 773 F.3d 1201 (Fed. Cir. 2014)

³⁷⁹ World Intell. Prop. Org. (WIPO), A FRAND in Need: Why Establishing Standardized Technologies Is So Complicated (2024), <https://www.wipo.int/web/wipo-magazine/articles/a-frand-in-need-why-establishing-standardized-technologies-is-so-complicated-69933>.



difficult for implementers to assess their legal obligations or evaluate the essentiality of a given patent. This lack of transparency frustrates efforts to create a fair and accountable FRAND ecosystem and reinforces informational asymmetries that disproportionately affect new entrants and innovators in emerging economies.

faith.

TOWARD A RECALIBRATED FRAMEWORK: NORMATIVE AND INSTITUTIONAL PROPOSALS

To address the persistent imbalances and inconsistencies in the global SEP licensing regime, a recalibrated framework must go beyond legal reform at the national level and embrace a multi-level, inclusive, and transparent governance architecture. Such a framework should aim to align innovation incentives with equitable access, ensuring that the benefits of standardized technologies are not monopolized by a few global actors but are broadly distributed. This section outlines four interlinked proposals that together constitute a normative roadmap for reform.³⁸⁰

Voluntary Licensing Registries

One of the most critical steps toward transparency is the establishment of voluntary, publicly accessible licensing registries. These could be maintained either by Standard Setting Organizations (SSOs) themselves or under the auspices of international bodies such as the World Intellectual Property Organization (WIPO). Such registries would include essential information like declared FRAND commitments, royalty ranges, licensing history, and timelines for negotiation. By reducing information asymmetries and enhancing accountability, licensing registries can serve as a valuable resource for implementers especially small firms and actors in developing economies seeking to negotiate fair terms.

Royalty Benchmarking Panels

To address the global inconsistency in royalty determination, the establishment of international royalty benchmarking panels is proposed. These panels, functioning under institutions such as WIPO or the World Trade Organization (WTO), would issue non-binding royalty benchmarks based on objective criteria, including technological value, market penetration, and comparable licensing agreements. While not enforceable per se, such benchmarks could guide national courts,

³⁸⁰ Ibid



regulators, and arbitration tribunals in making consistent and equitable royalty assessments, thus narrowing the wide variance currently observed in cross-jurisdictional litigation.³⁸¹

Cross-Border Dispute Resolution Mechanisms

Given the international nature of SEP disputes, there is a pressing need for specialized cross-border dispute resolution mechanisms. International arbitration and mediation platforms, such as WIPO's Arbitration and Mediation Center, could be expanded to handle SEP-specific cases, with expert panels that understand both the technical and legal complexities of FRAND licensing. Such mechanisms would reduce litigation costs, prevent forum shopping, and promote coherent jurisprudence across jurisdictions.

Inclusion of the Global South in Standard-Setting Bodies

Meaningful reform cannot be achieved without inclusive representation. Countries in the Global South must be more actively involved in SSOs and international IP policy dialogues. Their participation is essential to ensure that global standards and licensing practices reflect a plurality of economic realities and support the development of indigenous innovation ecosystems. Without such inclusion, FRAND governance risks reinforcing global technological hierarchies rather than dismantling them.

IMPLICATIONS FOR DEVELOPING ECONOMIES AND TECHNOLOGY ACCESS

The implications of FRAND licensing reform are particularly profound for developing economies in the Global South, where equitable access to technology is essential not only for market participation but also for broader developmental goals. In these regions, the governance of Standard Essential Patents (SEPs) is not a narrow legal or commercial issue it is intimately linked with digital inclusion, industrial policy, and socio-economic empowerment.³⁸²

At present, the global SEP licensing ecosystem tends to privilege the interests of large multinational patent holders, many of whom are concentrated in advanced economies. These entities often control the core technologies embedded in global standards, such as 3G/4G/5G telecommunications, Wi-Fi protocols, and smart device interoperability. Licensing these technologies typically involves significant

³⁸¹ European Union Intell. Prop. Off., Standard Essential Patents: SEP Basics (2024), <https://euipo.europa.eu/ohimportal/en/news/-/action/view/9449023>.

³⁸² India Intell. Prop. Helpdesk, Standard Essential Patent Landscape in India – Part 1 (2024), https://intellectual-property-helpdesk.ec.europa.eu/news-events/news/standard-essential-patent-landscape-india-part-1-2024-01-04_en.



costs, complex negotiations, and legal uncertainties barriers that disproportionately affect firms and governments in developing countries. Excessive royalty demands and opaque licensing processes can inflate the price of mobile phones, delay the rollout of digital infrastructure, and deter local firms from entering technology-intensive sectors.³⁸³ Conversely, a recalibrated and transparent FRAND regime can serve as a catalyst for inclusive digital development. If SEP holders are required to license their patents on genuinely fair, reasonable, and non-discriminatory terms defined through transparent benchmarks and enforced through accessible dispute resolution mechanisms the following benefits can accrue to developing economies:

1. TECHNOLOGY TRANSFER AND LOCALIZATION

A more balanced FRAND framework can facilitate technology transfer, enabling local firms to acquire, adapt, and build upon globally standardized technologies. This promotes domestic value addition and encourages the localization of manufacturing, particularly in strategic sectors such as telecommunications equipment, semiconductors, and medical devices. Equitable licensing terms can reduce dependence on foreign technology providers and empower emerging market firms to integrate into global supply chains.

2. AFFORDABLE ACCESS TO DIGITAL INFRASTRUCTURE

Digital infrastructure such as mobile networks, IoT systems, and broadband connectivity is essential for education, healthcare, governance, and commerce. By reducing the cost burden of SEP licensing, reformed FRAND practices can ensure that governments and service providers in developing countries can deploy digital solutions at scale and at lower cost. This is especially critical in rural and underserved areas where affordability remains a major barrier to digital access.

3. DEVELOPMENT OF INDIGENOUS INNOVATION ECOSYSTEMS

FRAND reform can also support the growth of indigenous innovation ecosystems. Startups, academic institutions, and small enterprises in the Global South often face barriers to entry in high-tech sectors due to IP access restrictions and prohibitive royalty structures. A more inclusive and transparent SEP licensing regime would enable these actors to participate in R&D, product development, and standard-setting activities, thereby fostering a culture of innovation rooted in local needs and contexts.

³⁸³ Khurana & Khurana, Standard Essential Patents (SEPs) and FRAND: A Delicate Balance in Innovation (2024), <https://www.khuranaandkhurana.com/2024/09/28/standard-essential-patents-seps-and-frand-a-delicate-balance-in-innovation/>.



In essence, reforming SEP governance is not only about market fairness it is a developmental imperative. As countries across Africa, Asia, and Latin America undergo rapid digital transformation, the structure of global IP regimes will significantly shape the trajectory of their technological futures. Ensuring that SEP licensing does not become a bottleneck for development is therefore critical.³⁸⁴ A reimagined FRAND framework characterized by transparency, fairness, and inclusivity can help bridge the technological divide between the Global North and South, paving the way for a more equitable, participatory, and sustainable digital order.

CONCLUSION

The global regime governing Standard Essential Patent (SEP) licensing stands at a critical inflection point. While the original intent behind Fair, Reasonable, and Non-Discriminatory (FRAND) commitments was to ensure a balance between the commercial interests of patent holders and the access needs of technology implementers, that balance is increasingly under strain. As this paper has demonstrated, the absence of definitional clarity, jurisdictional coherence, and globally consistent enforcement mechanisms has led to regulatory fragmentation, commercial uncertainty, and inequitable outcomes particularly for actors in the Global South. The challenges associated with SEP licensing are not merely technical or contractual; they are deeply normative and institutional. FRAND is more than a licensing formula it is a principle of market fairness intended to ensure that the benefits of standardized technologies are not confined to a small set of multinational rightsholders, but are more widely distributed across geographies, sectors, and scales of economic development.³⁸⁵ However, without clear guidelines on what constitutes “fair,” “reasonable,” or “non-discriminatory,” the principle is rendered vulnerable to divergent interpretations and strategic manipulation. Courts and regulators across jurisdictions have adopted differing standards for royalty setting, injunctive relief, and good faith negotiations, resulting in forum shopping, litigation fatigue, and legal unpredictability. This paper has proposed a recalibrated FRAND framework one that integrates transparency, normative harmonization, and inclusive institutional design. It advocates for the creation of voluntary licensing registries, royalty benchmarking panels, cross-border dispute resolution mechanisms, and most importantly, the active inclusion of developing economies in standard-setting bodies and global

³⁸⁴ Indian Council for Research on Int'l Econ. Rels. (ICRIER), Navigating SEP Licensing in India (2023), https://icrier.org/pdf/Cellular-Standard-Essential-Patents_Policy-Brief-1.pdf.

³⁸⁵ Antitrust Div., U.S. Dep't of Just., Business Review Letter to IEEE on FRAND Licensing (2015), <https://www.justice.gov/atr/response-institute-electrical-and-electronics-engineers-incorporated>.



IP governance dialogues. Together, these reforms can help forge a more coherent and just SEP licensing ecosystem one that rewards innovation while safeguarding access. Such a framework is not just desirable but necessary in the context of an expanding digital economy, where technologies embedded in global standards touch virtually every aspect of life from mobile communication and health services to transportation systems and smart cities. If SEP governance continues to operate in a manner that privileges proprietary control over public benefit, it risks deepening the digital divide and excluding large portions of the world's population from full participation in the knowledge economy. Conversely, a reformed FRAND regime grounded in equity, accountability, and global cooperation offers a path toward a more inclusive technological future. It would empower emerging economies to pursue indigenous innovation, enable smaller firms to engage in competitive product development, and ensure that the global standardization system functions not just as a commercial platform but as an instrument of shared progress.³⁸⁶ The time is ripe for the international community jurisdictions, standard-setting organizations, multilateral institutions, and private stakeholders to come together to articulate a shared vision for sustainable SEP governance. A global consensus on FRAND enforcement, grounded in both legal rigor and development ethics, can create the conditions for responsible innovation, fair competition, and digital justice. In this moment of technological acceleration and structural inequality, recalibrating FRAND is not merely a technical reform it is a necessary step toward constructing a more balanced, participatory, and future-ready intellectual property order.



³⁸⁶ Fed. Trade Comm'n, Standard-Setting and FRAND Licensing (2024), <https://www.ftc.gov/news-events/news/speeches/standard-setting-frand-licensing>.



CHAPTER 13

FRAND COMMITMENTS AND ROYALTY ALLOCATION IN STANDARD-ESSENTIAL PATENT POOLS: LEGAL UNCERTAINTY AND POLICY GAPS

- Paritosh Singh Dev*

ABSTRACT

*The rapid proliferation of interoperable technologies, ranging from wireless communication protocols to emerging standards in artificial intelligence and the Internet of Things, has rendered Standard-Essential Patents (SEPs) a cornerstone of contemporary innovation ecosystems. Patent pools, functioning as collective licensing arrangements for SEPs, have emerged as a mechanism to reduce transactional complexity, facilitate access to technology, and ostensibly promote efficiency. Central to their legitimacy, however, is the commitment by SEP holders to license on Fair, Reasonable, and Non-Discriminatory (FRAND) terms, a commitment that remains deeply contested in both its interpretation and implementation. This paper interrogates the legal uncertainties surrounding FRAND commitments in the context of royalty determination within patent pools. It examines how divergent judicial approaches, lack of transparency in pool governance, and the inconsistent application of essentiality assessments have contributed to systemic ambiguity. By critically analysing leading cases; including *Unwired Planet v. Huawei* (UK), *FTC v. Qualcomm* (US), and *Ericsson v. Intex* (India); the paper identifies doctrinal inconsistencies in defining "reasonable" royalties and assessing discriminatory licensing conduct. The methodology adopted is doctrinal and comparative, involving an in-depth analysis of legislative frameworks, judicial pronouncements, and SSO policies across multiple jurisdictions. Special attention is given to the structural asymmetries between developed and developing jurisdictions in navigating the intersection of patent law, competition policy, and innovation goals.*

KEYWORDS: Standard-Essential Patents, FRAND Commitments, Patent Pools, Royalty Determination

INTRODUCTION

Innovation today is increasingly driven by interoperable technologies that enable wireless communications, the Internet of Things (IoT), and artificial intelligence (AI). At the centre of this

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architecture are Standard-Essential Patents (SEPs), which protect technologies indispensable to compliance with technical standards. The licensing of SEPs has shifted from bilateral negotiation to a complex legal and policy battleground with significant implications for competition, access, and innovation. Patent pools have developed as collective licensing mechanisms to reduce transaction costs, ease access, and mitigate hold-up risks. Yet these benefits rest on commitments by SEP holders to license on Fair, Reasonable, and Non-Discriminatory (FRAND) terms. Despite this centrality, FRAND remains legally ambiguous and economically contested. Courts and scholars diverge on whether FRAND obligations are contractual duties rooted in Standard Setting Organisations (SSOs) or broader competition law responsibilities. Judicial interpretations further compound uncertainty: the UK Supreme Court in *Unwired Planet v. Huawei* endorsed global licences, the U.S. Ninth Circuit in *FTC v. Qualcomm* narrowed antitrust scrutiny, while Indian courts oscillate between public interest and contractual enforcement. These inconsistencies spill into disputes over royalties, non-discrimination, and global licensing obligations, with patent pool governance offering little clarity. Weak institutional frameworks and absent essentiality checks allow over-declaration of patents and inflated royalty demands, risks magnified in emerging economies where bargaining asymmetries are acute. This paper examines these doctrinal and policy gaps and proposes reforms including independent essentiality verification, statutory royalty benchmarks, and greater transparency in pool governance. Without such measures, FRAND risks becoming rhetorical rather than a meaningful safeguard for equitable access.

THE LEGAL AND CONCEPTUAL ARCHITECTURE OF FRAND COMMITMENTS

The FRAND (Fair, Reasonable, and Non-Discriminatory) commitment, though central to global licensing, remains marked by definitional ambiguity and divergent interpretations. It arises when a Standard-Essential Patent (SEP) holder, whose patent covers technology indispensable to an industry standard, pledges to license on equitable terms to willing implementers. Such commitments, typically made through Standard Setting Organisations (SSOs), aim to reduce the risk of patent hold-up, where SEP holders demand excessive royalties after standards are adopted. Yet the legal status, scope, and enforceability of FRAND obligations remain subjects of significant doctrinal debate.



THE CONTRACTUAL FOUNDATION OF FRAND OBLIGATIONS

In legal theory, FRAND commitments are typically conceptualised as third-party beneficiary contracts. Under this model, the SEP holder enters into an agreement with an SSO, and implementers who are not direct parties to the agreement become beneficiaries of the licensing promise. This view has been endorsed in several jurisdictions. In *Microsoft Corp. v. Motorola, Inc.*, the U.S. District Court held that a FRAND commitment constituted a binding contract enforceable by third parties.³⁸⁷ The court emphasised that SSOs like the IEEE required members to agree to license SEPs on FRAND terms, creating a justiciable contractual obligation.

A similar approach was adopted in *Apple Inc. v. Motorola Mobility, Inc.*, where the United States Court of Appeals for the Federal Circuit recognised that FRAND commitments imposed enforceable limits on the royalty demands an SEP holder could make.³⁸⁸ Nonetheless, questions arise regarding the scope and specificity of the commitment: What precisely constitutes “fair” or “reasonable” pricing? Does the non-discriminatory component permit different terms for different licensees based on market structure?

FRAND AS A COMPETITION LAW CONSTRUCT

Parallel to the contractual perspective is the competition law dimension of FRAND, particularly relevant in cases involving dominant SEP holders. In jurisdictions like the European Union, refusal to license SEPs on FRAND terms can constitute an abuse of dominant position under Article 102 of the Treaty on the Functioning of the European Union (TFEU). The Court of Justice of the European Union (CJEU) in *Huawei Technologies Co. Ltd. v. ZTE Corp.*³⁸⁹ laid down a structured framework to assess when the enforcement of an SEP may breach competition law. According to the CJEU, an SEP holder must alert the alleged infringer of the infringement and present a written FRAND offer before seeking an injunction. If the implementer fails to diligently respond, the SEP holder may proceed with enforcement actions without violating Article 102.

This framework, while influential, has not resolved deeper questions. Notably, it does not define what counts as a “FRAND-compliant” offer or whether global portfolio licensing (as seen in *Unwired Planet*) inherently satisfies the non-discrimination requirement.³⁹⁰ Furthermore, antitrust authorities such as

³⁸⁷ *Microsoft Corp. v. Motorola, Inc.*, 696 F.3d 872 (9th Cir. 2012).

³⁸⁸ *Apple Inc. v. Motorola Mobility, Inc.*, 757 F.3d 1286 (Fed. Cir. 2014).

³⁸⁹ *Huawei Technologies Co. Ltd. v. ZTE Corp.*, Case C-170/13, ECLI:EU:C:2015:477.

³⁹⁰ *Unwired Planet International Ltd. v. Huawei Technologies Co. Ltd.*, [2020] UKSC 37.



the European Commission and the U.S. Federal Trade Commission (FTC) have adopted inconsistent stances, sometimes treating the refusal to license as an antitrust violation and other times as a matter of private law.³⁹¹

INTERPRETIVE FRAGMENTATION ACROSS SSOS

Compounding the legal ambiguity is the variation in SSO policies concerning FRAND. Different SSOs offer divergent formulations of licensing obligations, and few provide precise metrics for assessing compliance. For example, the European Telecommunications Standards Institute (ETSI) requires members to license on FRAND terms but does not define these terms or prescribe royalty calculation methodologies.³⁹² The Institute of Electrical and Electronics Engineers (IEEE) has gone a step further by incorporating guidelines that favour the “smallest saleable patent-practising unit” (SSPPU) as the royalty base a shift that has attracted both praise and criticism.³⁹³

This lack of harmonisation among SSOs leads to strategic behaviour by SEP holders, who may engage in forum shopping or selective pool participation depending on the legal environment. Such asymmetry frustrates attempts to arrive at consistent global licensing practices and exacerbates litigation.

THE NORMATIVE TENSION: BALANCING INCENTIVES AND ACCESS

The FRAND commitment lies at the confluence of two competing imperatives: the need to reward innovators and the goal of ensuring access to standards. Excessively high royalties risk excluding smaller firms from the market, while overly stringent limits on returns disincentivise investment in standard-essential innovation. As Lemley and Shapiro argue, a nuanced understanding of FRAND must consider both ex-ante competition (before the standard is adopted) and ex-post market power (after the standard becomes indispensable).³⁹⁴

Yet, the inherent vagueness of “fairness” and “reasonableness” in FRAND lends itself to opportunism. SEP holders may assert global licensing demands without disclosing comparable licensing data, while

³⁹¹ Douglas H. Ginsburg, Joshua D. Wright, “Antitrust Enforcement in Standard Essential Patent Licensing: What Should Be the Role of Competition Authorities?” *Journal of Competition Law & Economics*, Vol. 9, No. 4 (2013), pp. 867–893.

³⁹² ETSI Intellectual Property Rights Policy, available at: <https://www.etsi.org>

³⁹³ IEEE-SA Standards Board Bylaws, Section 6 (updated 2023), available at: <https://standards.ieee.org>

³⁹⁴ Mark Lemley & Carl Shapiro, “A Simple Approach to Setting Reasonable Royalties for Standard-Essential Patents,” *Berkeley Technology Law Journal*, Vol. 28, No. 2 (2013), pp. 1135–1166.



implementers may engage in hold-out by indefinitely delaying agreement. Courts and regulators must, therefore, engage in delicate balancing to preserve both incentive structures and market competition.

TOWARDS DOCTRINAL CLARITY

Some scholars have called for the codification of FRAND obligations to reduce uncertainty. For instance, Contreras has advocated for model licensing terms endorsed by SSOs or governments to serve as a default template.³⁹⁵ Others argue for binding arbitration mechanisms as a means of avoiding protracted litigation, especially in cross-border disputes. While the European Commission's recent proposal for a Regulation on SEPs which includes mandatory essentiality checks and transparency obligations is a promising step, it remains to be seen how such regulation will interface with global trade rules and existing IP frameworks.³⁹⁶

ROYALTY ALLOCATION MECHANISMS IN PATENT POOLS

The allocation of royalties within patent pools collective licensing arrangements wherein multiple Standard-Essential Patent (SEP) holders aggregate and license their patents under a unified scheme is a focal point of both practical complexity and legal uncertainty. These pools are established with the ostensible objective of facilitating access to essential technologies, lowering transaction costs, and mitigating patent thickets. Yet, the legitimacy and efficacy of such mechanisms critically hinge on the manner in which royalty proceeds are divided among participating SEP holders. This distribution not only influences intra-pool dynamics but also directly affects the licensing terms imposed on implementers, especially with regard to compliance with FRAND (Fair, Reasonable, and Non-Discriminatory) commitments.

Royalty allocation is far from a technical afterthought; it is a normative exercise that straddles the domains of innovation policy, competition law, and contract theory. Despite this, most patent pools remain opaque in their internal distribution frameworks, and many lack independent verification mechanisms for determining the essentiality or relative value of each contributing patent.

³⁹⁵ Jorge L. Contreras, "Much Ado About Hold-Up," *Harvard Journal of Law & Technology*, Vol. 29, No. 2 (2016), pp. 498–523.

³⁹⁶ Proposal for a Regulation of the European Parliament and of the Council on Standard Essential Patents, COM(2023) 232 final.



ROYALTY DISTRIBUTION MODELS: THEORY AND PRACTICE

In principle, royalty allocation within patent pools may be based on several models: proportional allocation, equal sharing, or value-based distribution. Proportional allocation, wherein royalties are divided based on the number of patents each licensor contributes, is the most commonly adopted model. However, this approach presumes a rough parity of value across all SEPs, a proposition that is empirically unsound. Studies have demonstrated that in most pools, only a small subset of patents are truly commercially significant or technologically indispensable.³⁹⁷ The MPEG LA pool, for instance, has been criticised for distributing royalties based on mere numerical contribution, resulting in overcompensation of marginal contributors and under-compensation of high-value innovators.³⁹⁸

With contrast, value-based allocation attempts to reward SEP holders based on the technical or economic contribution of each patent. While this model aligns more closely with principles of efficiency and fairness, its implementation is fraught with subjectivity and administrative burden. Determining the relative value of patents within a highly integrated technological standard requires robust technical analysis, market data, and often, expert adjudication. Such mechanisms are rarely institutionalised within pool governance structures.

Some pools, such as Avanci, offer a hybrid model, combining royalty caps with tiered payment schemes based on product categories and regions. Yet, even these approaches fail to address the core concern of asymmetry between declared and actually essential patents.³⁹⁹

ESSENTIALITY CHECKS AND THE PROBLEM OF OVER-DECLARATION

A fundamental structural flaw in many patent pools is the lack of rigorous, independent essentiality assessments. SEP holders often self-declare the essentiality of their patents when joining a pool. This practice incentivises over-declaration, where firms include patents that may be only marginally related to the standard or not essential at all. This phenomenon artificially inflates their share of the royalty pool, distorting both intra-pool equity and the FRAND obligation toward licensees.

³⁹⁷ Anne Layne-Farrar, “Innovative or Indefensible? An Empirical Assessment of Patenting within Standard Setting,” *International Journal of IT Standards and Standardization Research*, Vol. 8, No. 1 (2010), pp. 1–18.

³⁹⁸ Brad Biddle et al., “How Many Standards in a Laptop? (And Other Empirical Questions),” *Stanford Law School Working Paper* (2010).

³⁹⁹ Rudi Bekkers, René Bongard & Alessandro Nuvolari, “Empirical Evidence on the Determinants of Essential Patent Claims in Compatibility Standards,” *Research Policy*, Vol. 40, No. 7 (2011), pp. 1001–1015.



In a comprehensive study of the ETSI 3G/4G pool, it was found that only 35% of declared SEPs were actually essential upon expert review.⁴⁰⁰ Yet, absent mandatory audits, these inflated declarations continue to underpin royalty allocation. This creates a moral hazard wherein SEP holders have no disincentive to misrepresent the essentiality of their portfolios. Additionally, implementers are placed at a disadvantage since they lack transparency and recourse to challenge inflated royalty demands without engaging in costly litigation.

The European Commission has recognised this issue and, in its 2023 Proposal for a Regulation on SEPs, introduced provisions for third-party essentiality checks conducted by certified bodies.⁴⁰¹ The Regulation aims to create a central register of SEPs and provide guidance for royalty rate determination. While these measures are commendable, their global applicability remains uncertain, especially in jurisdictions with weak institutional capacities.

CASE EXAMPLES: MPEG LA, AVANCI, AND SISVEL

An examination of MPEG LA, one of the oldest and most influential pools, illustrates the persistent tension between efficiency and fairness. MPEG LA has often been credited with facilitating wide-scale adoption of video compression standards (e.g., H.264). However, it has also faced criticism for a lack of transparency in how royalty shares are determined. The refusal to disclose exact allocation formulas raises concerns about discriminatory practices, particularly when major contributors receive confidential “premium” shares.⁴⁰²

Avanci, which manages SEP licensing for automotive connectivity, has positioned itself as a more transparent alternative. In 2023, it announced a flat-rate licensing fee for 5G-connected vehicles, thereby eliminating per-patent negotiations.⁴⁰³ Yet, Avanci has also been accused of favouring larger SEP holders by setting pool rates that small licensees cannot negotiate. This asymmetry undermines the FRAND principle, particularly its non-discrimination component.

⁴⁰⁰ Technical University of Berlin, “Essentiality Checks for Standard-Essential Patents,” EUIPO Research Project (2022).

⁴⁰¹ European Commission, “Proposal for a Regulation on Standard Essential Patents,” COM(2023) 232 final.

⁴⁰² Jorge L. Contreras, “Transparency and FRAND Royalties in Patent Pools,” *Knowledge Ecology International* (2017).

⁴⁰³ Avanci, “5G Vehicle Licensing Terms,” available at: <https://www.avanci.com/5g-licensing>.



Sisvel, operating primarily in Wi-Fi and audio compression pools, has introduced mechanisms such as licensee-specific pricing and arbitration panels.⁴⁰⁴ While this represents progress, the reliance on non-binding dispute resolution mechanisms limits its effectiveness in addressing systemic royalty disputes.

ROYALTY STACK AND CUMULATIVE BURDEN ON IMPLEMENTERS

Another critical concern is the issue of royalty stacking, wherein implementers must pay cumulative royalties to multiple SEP holders or pools for a single product. This scenario is particularly pronounced in high-tech devices like smartphones, which must comply with multiple overlapping standards. Lemley and Shapiro have described this as a form of “tragedy of the anticommons,” where fragmented ownership inflates licensing costs.⁴⁰⁵

Patent pools were intended to mitigate this problem by offering “one-stop” licensing. However, in practice, competing pools for the same standard or exclusion of key SEP holders from major pools have exacerbated royalty fragmentation. For instance, the coexistence of MPEG LA and HEVC Advance for H.265 video compression led to confusion and higher cumulative licensing fees.⁴⁰⁶

In the absence of unified or coordinated pool structures, implementers remain vulnerable to redundant payments and strategic enforcement actions. This undermines the economic justification of patent pools and invites regulatory scrutiny under competition law.

GOVERNANCE AND ACCOUNTABILITY IN POOL ADMINISTRATION

Most patent pools are operated by private licensing entities or consortia with limited external oversight. This raises serious concerns regarding accountability, governance, and fairness. Pool administrators often control not only license negotiations but also distribution formulas, essentiality criteria, and dispute resolution mechanisms. Yet, the lack of regulatory audits or stakeholder representation allows powerful SEP holders to dominate pool policies.

The Japan Fair Trade Commission (JFTC) in its 2005 guidelines emphasised the need for non-discriminatory and transparent management of pools, recommending independent experts in royalty

⁴⁰⁴ Sisvel Licensing, “Alternative Dispute Resolution Mechanisms,” available at: <https://www.sisvel.com>.

⁴⁰⁵ Mark A. Lemley and Carl Shapiro, “Patent Holdup and Royalty Stacking,” *Texas Law Review*, Vol. 85 (2007), pp. 1991–2049.

⁴⁰⁶ Timothy Simcoe et al., “Patent Pools: Licensing and Antitrust,” *OECD Competition Committee Report* (2014).



determination.⁴⁰⁷ However, such best practices have not been institutionalised in major global pools, and the influence of dominant licensors continues to skew outcomes.

JUDICIAL INTERPRETATIONS AND DOCTRINAL INCONSISTENCIES

While the promise of licensing Standard-Essential Patents (SEPs) on Fair, Reasonable, and Non-Discriminatory (FRAND) terms serves as a foundational tenet in modern standardisation frameworks, courts across jurisdictions have struggled to converge on a consistent judicial understanding of what precisely constitutes "fairness", "reasonableness", or "non-discrimination". These terms while intuitively appealing lack codified definitions and are often interpreted in light of differing national legal traditions, competition policy objectives, and economic considerations. The result has been a proliferation of doctrinal inconsistencies that not only increase legal uncertainty for parties to licensing disputes but also inhibit the development of harmonised global practices. This section critically examines the major judicial pronouncements on FRAND obligations in the United Kingdom, the United States, and India, underscoring their interpretive divergences and their normative consequences for royalty determination and discriminatory licensing conduct.

UNWIRED PLANET V. HUAWEI (UK): GLOBAL FRAND RATES AND THE SCOPE OF NON-DISCRIMINATION

The seminal decision of the UK Supreme Court in *Unwired Planet International Ltd. v. Huawei Technologies Co. Ltd.* [2020] UKSC 37 is among the most consequential judgments in the realm of FRAND jurisprudence. The case involved the licensing of telecommunications SEPs under the ETSI standard and raised three core issues: (i) whether UK courts have jurisdiction to determine global FRAND terms; (ii) whether the SEP holder must offer identical terms to all licensees (i.e., a "hard" non-discrimination obligation); and (iii) the interface between FRAND licensing and competition law.

The Court held that UK courts may indeed determine global FRAND rates, reasoning that in a highly integrated global market, the licensing of SEPs cannot be meaningfully segmented by jurisdiction.⁴⁰⁸ It rejected Huawei's contention that only national licenses should be considered "reasonable", holding that a global license was not only commercially rational but also compatible with the FRAND obligation.

⁴⁰⁷ Japan Fair Trade Commission, "Guidelines for the Use of Intellectual Property under the Antimonopoly Act," 2005.

⁴⁰⁸ *Unwired Planet International Ltd. v. Huawei Technologies Co. Ltd.*, [2020] UKSC 37.



Importantly, the Court embraced a “general” non-discrimination principle, holding that licensors are not bound to offer identical terms to all licensees. Instead, the obligation is to avoid terms that would place similarly situated licensees at a “material competitive disadvantage”.⁴⁰⁹ This ruling departed from the stricter interpretation proposed in earlier German cases (such as *Orange Book Standard*) and introduced a more economically contextual understanding of discrimination. However, the decision has been criticised for privileging the interests of SEP holders by normalising global portfolio licensing, thereby placing pressure on smaller implementers who may lack the resources to contest global royalty terms.⁴¹⁰

FTC V. QUALCOMM (US): ANTITRUST, EXCLUSIVITY, AND MARKET FORECLOSURE

In the United States, the Federal Trade Commission (FTC) brought a high-profile antitrust action against Qualcomm Inc., alleging that its SEP licensing practices violated Section 2 of the Sherman Act by excluding rivals and harming competition in the modem chip market.⁴¹¹ The District Court ruled in favour of the FTC, holding that Qualcomm’s “no license, no chips” policy wherein it refused to supply chips to implementers who did not first agree to license SEPs constituted anticompetitive conduct.⁴¹² However, the Ninth Circuit reversed this decision, emphasising that antitrust law does not impose a duty to deal or to offer FRAND terms in a specific format unless exceptional circumstances apply. It held that Qualcomm’s business model was “hypercompetitive, not anticompetitive”, and declined to assess the fairness of the royalty rates under the Sherman Act.⁴¹³

This ruling created significant divergence from the European approach, particularly in its narrow conception of FRAND as a contractual rather than antitrust issue. While the CJEU in *Huawei v. ZTE* construed the SEP holder’s refusal to license as a potential abuse of dominance, the Ninth Circuit appeared reluctant to extend antitrust liability into what it perceived to be domain of private ordering and commercial discretion. Critics have observed that this approach risks undermining FRAND’s regulatory function by removing competition law as a backstop against discriminatory or exclusionary

⁴⁰⁹ *Ibid.*, at [113].

⁴¹⁰ Brad Biddle, Andrew White & Sean Woods, “How Many Standards in a Laptop? And Other Empirical Questions,” *Stanford Public Law Working Paper* (2010).

⁴¹¹ *Federal Trade Commission v. Qualcomm Inc.*, 411 F. Supp. 3d 658 (N.D. Cal. 2019), rev’d, 969 F.3d 974 (9th Cir. 2020).

⁴¹² *Ibid.*, District Court opinion at 711–714.

⁴¹³ *FTC v. Qualcomm*, 969 F.3d at 984–85.



licensing practices.⁴¹⁴ It also exposes smaller licensees to “take-it-or-leave-it” offers from SEP holders without substantive judicial scrutiny.

ERICSSON V. INTEX (INDIA): ROYALTY BASE AND NATIONAL INTEREST

The Indian jurisprudence on FRAND remains nascent but has shown early signs of adopting a protectionist and pro-access stance. In *Telefonaktiebolaget LM Ericsson v. Intex Technologies (India) Ltd.* (2015) SCC OnLine Del 13917, the Delhi High Court addressed the calculation of interim royalties for SEPs in the absence of an agreed license. The Court observed that Ericsson's demand of a royalty based on the end-product value (i.e., entire mobile phone) rather than the price of the patented component (i.e., chipset) was *prima facie* excessive.⁴¹⁵

The Court directed a temporary licensing arrangement using a modified “smallest saleable patent-practising unit” (SSPPU) method, echoing U.S. debates on the appropriate royalty base.⁴¹⁶ However, the judgment refrained from setting a definitive methodology for FRAND rate calculation and emphasised the need to balance incentives to innovate with consumer access to affordable technology. The Competition Commission of India (CCI) has also investigated SEP licensing under the Competition Act, 2002, particularly under Section 4 (abuse of dominant position). In its *Micromax v. Ericsson* order, the CCI took cognisance of Ericsson's practice of imposing non-negotiable royalty terms and demanded greater transparency in licensing negotiations.⁴¹⁷

Although these interventions indicate a willingness to protect local implementers, the lack of codified guidelines and the absence of judicial convergence continue to limit the predictability and enforceability of FRAND in India.

DOCTRINAL FRAGMENTATION AND ITS CONSEQUENCES

The above decisions underscore a pronounced doctrinal fragmentation in global FRAND jurisprudence. Three key inconsistencies emerge:

⁴¹⁴ Jorge L. Contreras, “The New Extraterritoriality: FRAND Royalties, Anti-Suit Injunctions and the Global Race to the Bottom,” *Chicago-Kent Journal of Intellectual Property*, Vol. 18 (2019), pp. 1–29.

⁴¹⁵ *Telefonaktiebolaget LM Ericsson v. Intex Technologies (India) Ltd.*, (2015) SCC OnLine Del 13917.

⁴¹⁶ Mark A. Lemley & Carl Shapiro, “A Simple Approach to Setting Reasonable Royalties for Standard-Essential Patents,” *Berkeley Technology Law Journal*, Vol. 28, No. 2 (2013), pp. 1135–1166.

⁴¹⁷ *In re Micromax Informatics Ltd. v. Ericsson*, Case No. 50/2013, Competition Commission of India, 12 November 2013.



- (i) **Territorial Scope:** Courts disagree on whether FRAND licenses should be determined globally (*Unwired Planet*) or on a jurisdiction-by-jurisdiction basis (*FTC v. Qualcomm* implicitly suggests the latter).
- (ii) **Non-Discrimination Standard:** The UK's adoption of a general non-discrimination obligation stands in contrast to stricter interpretations favoured in some EU states and in Indian competition law assessments.
- (iii) **Role of Competition Law:** The U.S. judiciary tends to treat FRAND disputes as private contractual matters, while the EU and Indian regulators increasingly view SEP licensing through the lens of market power and public interest.

These inconsistencies have significant implications for forum shopping, litigation strategy, and regulatory arbitrage. SEP holders may select jurisdictions that allow global licensing, limited antitrust scrutiny, and deferential royalty assessments. Implementers, on the other hand, must navigate a fractured and uncertain legal terrain with limited leverage and potentially exorbitant costs.

THE NEED FOR JUDICIAL HARMONISATION

To remedy the doctrinal divergence, there is a growing call for the adoption of transnational guidelines or interpretive convergence mechanisms. The 2013 European Commission Communication on SEPs stressed the importance of proportionality, transparency, and third-party essentiality checks, but such principles have yet to be adopted globally.⁴¹⁸

Academic proposals include the establishment of international arbitration panels, publication of anonymised licensing terms to serve as comparables, and mandatory disclosure of standard-specific licensing practices by SEP holders.⁴¹⁹ The recently proposed EU Regulation on SEPs seeks to institutionalise many of these reforms, including an SEP register, essentiality checks, and a conciliation body for royalty determination.⁴²⁰ While such initiatives hold promise, their effectiveness will depend on *jurisdictional uptake*, *inter-agency cooperation*, and political will particularly in balancing national industrial strategies with international commitments to equitable licensing practices.

⁴¹⁸ European Commission, "Communication on Setting out the EU Approach to Standard Essential Patents," COM(2017) 712 final.

⁴¹⁹ Damien Geradin & Miguel Rato, "Can Standard-Setting Lead to Exploitative Abuse? A Dissonant View on Patent Hold-Up, Royalty Stacking and the Meaning of FRAND," *European Competition Journal*, Vol. 3, No. 1 (2007), pp. 101–161.

⁴²⁰ European Commission, "Proposal for a Regulation on Standard Essential Patents," COM(2023) 232 final.



GOVERNANCE, COMPETITION POLICY, AND DEVELOPING ECONOMY CONCERNS

While FRAND-based licensing of Standard-Essential Patents (SEPs) is intended to balance innovation incentives with equitable access to technology, structural deficiencies in patent pool governance and asymmetries in global enforcement mechanisms have given rise to significant competition policy concerns particularly in developing jurisdictions. This section explores three interrelated dimensions: opaque governance within patent pools, divergent antitrust responses, and the institutional vulnerabilities of emerging economies navigating the SEP landscape.

GOVERNANCE DEFICITS IN PATENT POOLS

Patent pools, though designed to streamline access to SEPs and reduce transaction costs, often suffer from opaque internal structures. Licensing terms, royalty sharing models, and admission criteria are typically determined by major contributors, without meaningful participation from smaller stakeholders or licensees.⁴²¹ This centralisation of control, combined with the absence of *independent essentiality checks*, enables SEP holders to over-declare non-essential patents, thereby inflating their share of royalties.⁴²² Empirical research into ETSI-declared SEPs has shown that a significant portion of declared patents are not technically essential.⁴²³ Nonetheless, without third-party validation mechanisms, implementers must either accept inflated royalty demands or engage in costly litigation undermining the integrity of the FRAND framework.

COMPETITION LAW APPROACHES

Antitrust regulators have taken varying approaches to SEP licensing. In the European Union, the *Huawei v. ZTE* decision by the Court of Justice of the EU mandates that SEP holders must engage in good-faith negotiations before seeking injunctive relief, lest they violate Article 102 of the TFEU.⁴²⁴ The European Commission has consistently highlighted the importance of transparency, non-discrimination, and proportionate royalty terms in ensuring competitive licensing.⁴²⁵

In contrast, the U.S. judiciary, as seen in *FTC v. Qualcomm*, has taken a more restrained view, emphasising contractual freedom and limiting antitrust scrutiny to egregious conduct.⁴²⁶ This

⁴²¹ Damien Geradin, "Patent Pool Licensing and Antitrust," *IJITSR*, Vol. 9(1), 2011, pp. 1–22.

⁴²² Rudi Bekkers et al., "IPR Disclosure in Standards," *EU Final Report*, DG Enterprise (2012).

⁴²³ TU Berlin, "Essentiality Checks for SEPs," *EU IPO Study* (2022).

⁴²⁴ *Huawei Technologies v. ZTE*, Case C-170/13, ECLI:EU:C:2015:477.

⁴²⁵ European Commission, "EU Approach to SEPs," COM(2017) 712 final.

⁴²⁶ *FTC v. Qualcomm*, 969 F.3d 974 (9th Cir. 2020).



divergence has opened avenues for forum shopping, with SEP holders leveraging favourable jurisdictions to enforce global royalty demands. Some Asian regulators, such as the Japan Fair Trade Commission (JFTC) and China's State Administration for Market Regulation, have adopted more interventionist policies, recognising that patent pools can become vehicles for market exclusion if improperly structured.⁴²⁷

CHALLENGES FOR DEVELOPING ECONOMIES

Developing countries face particular challenges in enforcing FRAND norms due to institutional weaknesses, lack of negotiating power, and limited access to licensing data. In India, the *Competition Commission of India (CCI)* has investigated SEP holders like Ericsson for allegedly abusing dominant positions by demanding royalties based on the value of end-products rather than components.⁴²⁸ However, the absence of formal FRAND legislation, coupled with procedural delays, has limited regulatory efficacy.

Domestic implementers are often ill-equipped to assess essentiality or negotiate favourable terms, leading to disproportionate settlements and potential barriers to market entry. Moreover, developing countries are *underrepresented* in standard-setting organisations, limiting their influence in shaping global licensing norms.⁴²⁹ While some nations such as China have deployed antitrust tools and imposed fines for anti-competitive SEP licensing, these approaches are not uniformly replicated. The constraints of international IP regimes, such as *TRIPS*, also restrict the scope for unilateral regulation, making *multilateral coordination* essential.

TOWARDS CLARITY: POLICY AND LEGAL REFORMS

The persistent ambiguity surrounding FRAND commitments particularly in the context of royalty allocation, essentiality, and governance necessitates targeted legal and institutional reforms. While courts and regulators have endeavoured to address specific disputes, a systemic approach is essential to ensure consistency, predictability, and fairness in SEP licensing. This section outlines key reform proposals grounded in international best practices and scholarship.

⁴²⁷ JFTC, "Guidelines on Standardization and Patent Pools," 2005.

⁴²⁸ *Micromax v. Ericsson*, Case No. 50/2013, CCI Order.

⁴²⁹ Srividhya Ragavan, "SEP Disputes and India's Public Interest Doctrine," *IJLT*, Vol. 13 (2017), pp. 78–103.



INDEPENDENT ESSENTIALITY ASSESSMENT

A foundational reform involves instituting *mandatory third-party essentiality assessments* before a patent can be included in a pool or benefit from FRAND presumptions. Currently, SEP holders self-declare essentiality, leading to over-declaration and distorted royalty distribution.⁴³⁰ The European Commission's 2023 draft *Regulation on SEPs* proposes the creation of accredited assessment bodies to verify technical essentiality a model that should be adopted more broadly.⁴³¹ Without this safeguard, licensing remains opaque and prone to manipulation.

STATUTORY ROYALTY GUIDELINES

The absence of statutory guidance on calculating FRAND royalties has resulted in conflicting methodologies across jurisdictions. Legislatures or SSOs should provide *non-binding royalty calculation frameworks*, incorporating factors such as the smallest saleable patent-practising unit (SSPPU), relative contribution of patents, and comparable license agreements.⁴³² This would constrain arbitrary royalty demands and promote commercial certainty.

Notably, the *IEEE's policy shift* in 2015, encouraging the SSPPU method and valuation of individual patent contributions, offers a prototype for such guidelines.⁴³³ However, such policies must be applied uniformly and transparently to prevent selective enforcement and regulatory capture.

LICENSING TRANSPARENCY AND DISCLOSURE

Implementers often lack access to previous licensing agreements, limiting their ability to negotiate fair terms or assess discriminatory practices. Reforms must mandate the disclosure of aggregate licensing data, anonymised contract summaries, and standardised terms. This transparency would deter opportunistic behaviour and support judicial assessment of FRAND compliance.⁴³⁴ The proposal to establish a centralised SEP register, as in the EU draft Regulation, would also enhance access to comparable licensing data and help regulators monitor abusive practices.⁴³⁵

ARBITRATION AND DISPUTE RESOLUTION

⁴³⁰ Rudi Bekkers et al., "IPR Disclosure in Standards," *EU Final Report*, DG Enterprise (2012).

⁴³¹ European Commission, "Proposal for a Regulation on SEPs," COM(2023) 232 final.

⁴³² Mark A. Lemley & Carl Shapiro, "A Simple Approach to Setting Reasonable Royalties," *Berkeley Tech. L.J.*, Vol. 28, No. 2 (2013), pp. 1135–1166.

⁴³³ IEEE-SA Standards Board Bylaws, Sec. 6 (2015).

⁴³⁴ Jorge L. Contreras, "Transparency and FRAND Royalties," *Knowledge Ecology International* (2017).

⁴³⁵ COM(2023) 232 final, *supra* note 2.



Given the global nature of SEP licensing, *neutral, binding arbitration mechanisms* may provide an efficient alternative to fragmented national litigation. Institutions such as WIPO and UNCITRAL could establish specialised panels with technical and legal expertise to adjudicate SEP disputes.⁴³⁶ Such mechanisms should be procedurally robust, transparent, and recognised across jurisdictions through international treaties or mutual recognition frameworks.

CONCLUSION

The FRAND commitment, central to SEP licensing, remains plagued by legal ambiguity, fragmented judicial interpretations, and opaque governance. Courts across jurisdictions diverge sharply: the UK Supreme Court in *Unwired Planet* endorsed global licensing, the U.S. Ninth Circuit in *FTC v. Qualcomm* limited antitrust scrutiny, and Indian authorities oscillate between public interest and contractual enforcement. Such inconsistencies fuel forum shopping, unpredictable royalties, and transactional complexity. Patent pool governance compounds these issues. The absence of independent essentiality checks enables over-declaration and inflated royalties, while dominant SEP holders often dictate opaque terms. Developing economies bear the brunt, facing coercive licensing, excessive costs, and barriers to innovation and digital self-reliance. Reform is imperative. Independent verification, statutory royalty guidance, greater transparency, and international arbitration could restore credibility. Without global coordination, FRAND risks devolving into rhetoric rather than a meaningful safeguard for equitable access and innovation.



⁴³⁶ WIPO Arbitration and Mediation Center, “Standard Essential Patents (SEPs) Disputes,” WIPO Guide (2022).



CHAPTER 14

PATENT POOLS AND COLLABORATIVE LICENSING MODELS: AN ANALYSIS

- Ninad Ramesh Patil*

ABSTRACT

This paper explores the structure, functioning, and obstacles associated with patent pools and collaborative licensing frameworks within the high-tech sector. It specifically focuses on how these systems can be effectively adapted and utilized in emerging economies. The core research question addresses how patent pools should be structured and managed to drive technological advancement while ensuring broad and equitable access especially in contexts of fast-paced industrial growth and technology transfer.⁴³⁷ The study uses a doctrinal legal approach combined with comparative case studies to examine scholarly writings, policy guidelines, and major industry models like MPEG LA, the Medicines Patent Pool⁴³⁸, and WIPO Research. With drawing insights from competition law analyses and organizational structures, the paper identifies optimal practices in areas such as royalty rate setting, transparency, and participation of small and medium-sized enterprises (SMEs). The paper offers practical models for creating patent pools that are inclusive, open, and supportive of fair competition, with a strong role for government intervention and inclusive governance mechanisms in developing countries.⁴³⁹ The outcomes are relevant to both regulatory bodies and industry leaders, providing strategic recommendations for aligning policies across jurisdictions, enhancing institutional capacities, and developing flexible royalty structures that promote fair growth and long-term sustainability. What sets this paper apart is its comprehensive approach that blends legal theory, real-world case analysis, and policy innovation to propose concrete solutions aligned with the goals of inclusive innovation and international partnership.⁴⁴⁰

KEYWORDS: Patent Tools, Standard Essential Patents, IP Royalty Determination, Essentiality Assessment

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⁴³⁷ Maskus, K.E., & Reichman, J.H. (2005). *The Globalization of Private Knowledge Goods and the Privatization of Global Public Goods*. Journal of International Economic Law.

⁴³⁸ Medicines Patent Pool. (2022). *Annual Report*. <https://medicinespatentpool.org>

⁴³⁹ Abbott, F.M., & Reichman, J.H. (2007). *The Doha Round's Public Health Legacy*. Journal of International Economic Law.

⁴⁴⁰ Ghidini, G. (2018). *Innovation, Competition and Consumer Welfare in Intellectual Property Law*. Edward Elgar Publishing.



INTRODUCTION

The issue of fragmented patent ownership, often referred to as a patent thicket, presents a significant hurdle for innovation. When a single product requires licenses from multiple patent holders, prospective manufacturers must navigate complex and costly negotiations, increasing both transaction fees and the risk of litigation. To address this inefficiency, solutions like patent pools and collaborative licensing frameworks have emerged. While initially popular in standards-based industries like telecommunications and video, these models have been successfully adapted for global public health initiatives, such as the Medicines Patent Pool (MPP) and the COVID-19 Technology Access Pool (C-TAP).

These collaborative efforts are designed to streamline licensing, eliminate blocking patents, accelerate the spread of complementary innovations, and improve access and affordability. This paper provides a comprehensive overview of these models, examining their economic underpinnings, organizational structures, key case studies in both the ICT and health sectors, and their overall impact. It also explores the associated antitrust risks and the future potential for new hybrid pooling arrangements.⁴⁴¹

THEORY & ECONOMIC FOUNDATIONS

Patent Thickets and Complementarity

A patent thicket is a complex web of intellectual property rights, where a single product or technology is covered by numerous patents owned by different entities. This is particularly common in advanced fields like semiconductors or pharmaceuticals. When innovators must secure multiple licenses to bring a product to market, they face a fragmented and inefficient licensing process. This can lead to a "hold-out" problem, where a single patent owner can prevent a product from being sold, ultimately hindering innovation and market entry.

Transaction Costs & Welfare Economics

Economic theory supports the idea that patent pools can be a powerful tool for streamlining innovation. By combining complementary patents under a single license, these pools dramatically lower the transaction costs associated with identifying, negotiating, and enforcing licenses. This reduction in friction makes it easier and faster to introduce new products. Research by Lerner and

⁴⁴¹ The 1995 U.S. FTC/DOJ *Antitrust-IP Guidelines* frame risk parameters for pool conduct under the rule of reason; and recent legal-policy literature emphasises growing regulatory scrutiny of pooling arrangements and the emergence of hybrid pooling models that blend commercial and public-health terms, requiring adaptive governance frameworks.



Tirole (2004) confirms that pools of complementary patents increase overall economic welfare by offering a single, more affordable aggregate royalty fee.

Hold-Up, Royalty Stacking and Bargaining Power

A significant risk in fragmented patent landscapes is patent hold-up, which occurs when a patent holder demands excessive royalties after their technology has become an essential part of an industry standard. This can be compounded by royalty stacking, where multiple patent owners each add their own fees, driving up the final cost for the end user. The threat of an injunction gives these patent holders considerable leverage in negotiations. While some models propose using volume-based agreements to curb this behaviour, negotiations often remain unpredictable.

Innovation Spillovers

Beyond simply making existing technologies more accessible, patent pools can also serve as a catalyst for new innovation. Studies have shown that when a pool is established, there is a subsequent increase in follow-on patents that build upon the pooled technologies. This is because a more open licensing environment allows new firms to more easily create modular additions to existing platforms. This evidence suggests that patent pools accelerate recombinatory innovation the process of creating new ideas by combining existing ones.⁴⁴²

GOVERNANCE & ORGANIZATIONAL DESIGN

Essentiality Testing and Inclusion Criteria

For a patent pool to be effective, it must carefully vet which patents are included. This process, known as essentiality testing, ensures that each patent is truly a necessary component of the final technology or standard. Well-established pools, such as those for MPEG-LA and DVD6C, employ independent technical experts to review patent claims. They start with a large number of submitted patents, often thousands, and through a rigorous and costly evaluation process, they identify only a fraction that are genuinely essential. The review for the MPEG-2 standard, for example, started with about 8,000 patents and resulted in only around 27 being deemed essential, demonstrating the high cost and complexity of this crucial screening process.

⁴⁴² Shimbo, Nagaoka & Tsukada (2024) analyze the DVD/Blu-ray case and find dynamic follow-on innovation: pool formation for DVDs led to significantly more innovation in the next-generation Blu-ray technologies and innovation among pool licensees, highlighting catalytic effects of pooling.



Licensing Terms: RAND, Tiered Royalty, Non-Discrimination

The licenses offered by patent pools are typically governed by Reasonable and Non-Discriminatory (RAND) principles. This means that the licensing terms, especially royalty rates, must be fair, transparent, and available to all potential licensees on the same basis. To encourage adoption, many pools use tiered royalty structures, where a lower or even zero royalty rate is applied to the first few thousand units produced, with a per-unit fee kicking in only after that threshold is met. This balances the need to incentivize patent owners with the goal of promoting widespread use of the technology. Licensees can also choose from various licensing models, such as those based on the specific use of the technology, the volume of products manufactured, or the number of devices sold.

Independent vs. Exclusive Licensing

A key decision in a patent pool's design is whether to offer a single, exclusive license for the entire portfolio or to also allow individual patent holders to license their patents independently. Economic theory suggests that when patents are complementary, allowing independent licensing is vital for market health. This approach prevents the pool from forming a monopoly and allows a licensee to negotiate directly with individual patent holders if they believe they can secure better terms. While a pool's "one-stop shop" license is convenient, mature pools often maintain a dual-licensing system that provides both the packaged license and the option for separate agreements.

Royalty Sharing and Governance

Patent pool revenue is distributed to the patent holders based on objective criteria, such as the number of patents they contributed and the degree to which each patent is considered essential. This ensures a fair and transparent compensation model. The pool itself is managed by a governance board that includes both member representatives and independent parties. This board is responsible for setting licensing policies, resolving disputes, and periodically reassessing the essentiality of older versus newer patents to ensure the royalty distribution remains equitable over time.⁴⁴³

CASE STUDIES: ICT PATENT POOLS***MPEG-LA & VVC Licensing***

⁴⁴³ Best-practice guidance from antitrust authorities recommends designating external oversight panels, technical auditors, or antitrust counsel to ensure that licensing practices remain transparent, competitive, and compliant with RAND/FRAND commitments over the pool's lifespan.



The MPEG-LA organization is a prominent example of a patent pool administrator, managing licenses for widely used video compression standards like H.264/AVC, HEVC (H.265), and VVC (H.266). The H.264/AVC pool, for instance, included thousands of patents from major technology companies like Dolby and Panasonic. In 2022, MPEG-LA introduced a new pool for the VVC standard, featuring contributions from various tech firms and offering a transparent, globally consistent licensing framework.

The key advantages of this pooling model were clear: it simplified the licensing process for manufacturers and content providers, and the use of royalty caps provided predictable costs. However, there were also challenges. The rise of open, royalty-free alternatives like AV1 created competition, and some reports suggest that licensing complexities contributed to a slower adoption rate for VVC, though the data on this remains inconclusive.

DVD6C and IEEE 1394

The DVD6C consortium, established in 1999, was an early and successful patent pool focused on DVD technology. With nine founding members, it aggregated the necessary patents to allow the manufacturing of DVD players and discs. Similarly, the pool for the IEEE 1394 (FireWire) standard brought together companies like Apple, Sony, and Samsung. These pools effectively demonstrated how patent aggregation could accelerate a new technology's adoption. However, they also highlighted a critical vulnerability: once a standard is replaced by a newer, superior technology (e.g., USB replacing FireWire), the pool's relevance and value rapidly decline, and it may become inactive.

3GPP / W-CDMA Joint Venture Patent Pools

The mobile communications industry provides another significant example of a patent pool. The 3G Patent Platform Partnership was a joint venture between major players like Nokia, Ericsson, and Qualcomm to license the essential patents for the W-CDMA standard. This pool used a sophisticated system of tiered licenses based on geography and usage. It also incorporated grant-back clauses, which required members to license any improvements to the core technology back to the pool, ensuring the collective benefit of all members. This model successfully promoted widespread manufacturing of 3G-enabled devices while maintaining a fair balance of incentives for the contributing companies.

Antitrust Scrutiny & Legal Precedents

Patent pools must be carefully structured to avoid antitrust violations. The U.S. government's 1995 Antitrust-IP Guidelines provide a framework, stating that pools of complementary patents that are



transparent and allow for independent licensing generally promote competition. However, pools that restrict competition or function as a cartel can face legal action. A landmark case involved the Summit/VISX PRK pool, where two competing laser eye surgery manufacturers pooled their patents. They then set a fixed, per-procedure fee, effectively eliminating price competition. The Federal Trade Commission (FTC) ruled this was illegal price-fixing, leading to the dissolution of the pool. This case established a clear precedent: patent pools that are used to fix prices or restrict competition, rather than to reduce transaction costs, are in violation of antitrust laws.

PUBLIC HEALTH & COLLABORATIVE LICENSING MODELS

The Medicines Patent Pool (MPP)

The Medicines Patent Pool (MPP), established in 2010 with backing from Unit aid, is a crucial public health initiative. It operates by negotiating voluntary, non-exclusive licenses with pharmaceutical companies for essential medicines, particularly for diseases prevalent in developing countries like HIV, hepatitis C, and tuberculosis. The MPP then sublicenses these rights to generic drug manufacturers in low- and middle-income countries (LMICs). This process is complemented by technology transfer and robust quality assurance measures, ensuring that the resulting generic drugs are safe and effective. According to its 2024 report, the MPP has been exceptionally successful, enabling the production of billions of treatment doses and saving the global community billions of dollars through increased generic competition. The report credits these licensing agreements with preventing millions of deaths and reducing the global disease burden.

Evidence of Health and Economic Impact

A study by Galasso and Schankerman provides compelling econometric evidence of the MPP's effectiveness. The research shows that when a patent is included in the MPP, the likelihood of it being licensed within a specific country increases more than five-fold. Furthermore, the entry of generic drug manufacturers and the launch of new drugs in those markets rise by 40%, particularly in LMICs with a moderate disease burden. These positive effects lead directly to lower drug prices, heightened market competition, and ultimately, better health outcomes for a large number of people.

WHO's COVID-19 Technology Access Pool (C-TAP)

Responding to the global pandemic, the World Health Organization (WHO), in partnership with Costa Rica, launched the COVID-19 Technology Access Pool (C-TAP) in May 2020. The goal was to create a repository for intellectual property, data, and manufacturing expertise related to COVID-19.



In practice, the MPP was instrumental in implementing C-TAP's licensing agreements. For example, a serological test developed by Spain's CSIC was licensed globally and made royalty-free for LMICs⁴⁴⁴, with the MPP facilitating sub-licensing to manufacturers like Biotech Africa.

In November 2021, the U.S. National Institutes of Health (NIH) added a portfolio of 11 key technologies to the pool, including essential vaccine components, under global non-exclusive terms. By mid-2023, several other institutions and companies had joined C-TAP agreements, enabling technology transfer and collaboration to boost global manufacturing capacity for COVID-19 tools.

Comparative Advantages

Health-focused patent pools like the MPP and C-TAP have distinct characteristics when compared to their ICT counterparts. Their primary goal is **equity and access**, rather than commercial profit. This is reflected in their use of tiered pricing, with royalty-free or very low-royalty sublicensing for LMICs. They also prioritize open knowledge transfer and adhere to the strict quality standards of the WHO. The governance of these pools often involves public health experts and global health organizations, and they primarily serve public-sector licensors and generic firms, underscoring their mission to address global health challenges.

EMPIRICAL EVIDENCE AND INNOVATION IMPACTS

ICT Sector Empirical Evidence

The positive impact of patent pools on innovation is well-documented within the Information and Communication Technology (ICT) sector. Analysis of patent citation networks reveals that participation in pools for standards like MPEG-2/AVC and Bluetooth has led to a significant increase in follow-on innovation. Researchers have observed a higher rate of new patents in adjacent technology areas, directly linked to the formation of these pools. Furthermore, baseline studies show that companies involved in these pools, both members and licensees, tend to invest more in research and development. These investments generate positive spillovers, fostering the development of vibrant and innovative ICT ecosystems.

Health Sector Evidence: Licensing and Launch

⁴⁴⁴ Unlike ICT-centered pools, MPP/C-TAP governance centers public health goals: licences are often royalty-free or tiered, LMIC needs are prioritized, and oversight combines public-sector leaders and health experts—not purely for-profit licensors.



Evidence from the health sector strongly supports the effectiveness of models like the Medicines Patent Pool (MPP). Independent studies confirm that the MPP model dramatically boosts licensing activity, with a five-fold increase in the number of licensing deals for pooled patents. This surge in licensing directly leads to a significant increase in the launch of new generic drugs and a higher volume of production. The impact of these efforts is not just economic; it translates into tangible health benefits, measured in millions of patient-years of treatment and a reduction in disability-adjusted life years (DALYs). These real-world outcomes demonstrate that the cost avoidance achieved through generic competition far outweighs the operational costs of the MPP.

Systems-Level Impacts

The success of patent pools is not just about the patents themselves, but also about their underlying governance and design. A key factor is the clarity and transparency of licensing terms and participation rules. Well-structured pools with clear policies have been shown to facilitate faster adoption of new technologies. In the public health sector, this has had a profound impact, enabling the establishment of local manufacturing capabilities in low- and middle-income countries (LMICs).⁴⁴⁵ This local production enhances healthcare resilience and ensures access to essential medicines, especially during public health emergencies. These effects often create positive spillovers, stimulating domestic innovation and attracting local investment. The early success of MPP-licensed drugs in India, for example, played a role in spurring local research and development in the generic pharmaceutical industry.

RISKS & ANTITRUST CONSIDERATIONS

Antitrust Law and Pool Scrutiny

Patent pools operate under close scrutiny from antitrust regulators, such as the FTC and DOJ. These agencies use a "rule of reason" approach to evaluate whether a pool is pro-competitive or anti-competitive. Regulators examine several key factors: whether the pool holds a dominant position in the market, if licensees can still negotiate with individual patent holders, if the patents are truly essential, and if the pool's terms are transparent and non-exclusive. This framework aims to ensure that pools function to reduce transaction costs rather than to stifle competition.

⁴⁴⁵ Access to Medicine Foundation (Oct 2023) and MPP governance analyses underscore that *voluntary licensing combined with technology transfer* significantly increases local medicine availability in LMICs, and contributes to the resilience and self-sufficiency of domestic healthcare systems.



Exclusion & Price Signaling

A major antitrust risk arises when a pool is formed with competing patents or if it excludes other parties, which can lead to it operating as an illegal price-fixing cartel. The landmark case of the Summit/VISX PRK pool serves as a prime example. The two companies, which were the sole providers of a specific laser eye surgery technology, combined their patents and agreed on a fixed per-procedure fee. The FTC determined this was an anti-competitive practice and dissolved the pool, illustrating that the combination of market dominance and price coordination is a red flag for regulators.

Royalty Stacking, Hold-Up, and Excessive Bargaining Power

The problem of royalty stacking occurs when the collective fees from multiple patent holders become excessively high, often to the detriment of consumers. The risk of patent hold-up further complicates matters, as companies may be unable to accurately budget for a product's costs when faced with unpredictable royalty demands. While well-designed pools can mitigate this, the risk remains, particularly if the pool includes patents that are substitutes for one another. Strategies like royalty caps and quantity-based licensing models can help to reduce this risk.

Inclusion Bias & Small-Holder Dilemma

Patent pools often face a challenge in ensuring equitable participation. The high costs and complexity of the essentiality evaluation process can be a barrier for smaller firms and independent inventors. As a result, the membership of mature pools can become concentrated among larger corporations, potentially leading to the under-compensation of smaller patent holders, even when their patents are critical. To address this, pools can implement transparent governance and offer subsidized membership evaluations to encourage broader participation.

EMERGING TRENDS & HYBRID MODELS

Hybrid Public-Private Pool Design

A new generation of hybrid patent pools is being developed to address both commercial interests and public health needs. These models combine traditional commercial licensing for high-income markets with a public-health-oriented framework for low- and middle-income countries. This could involve flexible royalty structures, geographical distinctions in licensing, and trigger-based clauses that allow for compulsory licensing in public health crises.

Open Innovation & Block Chain-Enabled Licensing



Future models for patent pools are exploring decentralized governance structures, particularly within academia and open innovation networks. These concepts envision pools that aggregate not just patents, but also know-how and clinical data. Technologies like blockchain could be used to transparently track the use of intellectual property, manage royalty distribution, and embed incentives that align with the principles of open science, such as those being considered for mRNA technology platforms.

Standards for Social Return & Impact Valuation

To encourage broader participation, new methods are being developed to quantify the social and health impact of pooled licensing. The MPP's "Value Project" is a leading example, which provides a framework for measuring the social returns of its work. By creating clear valuation standards, these models could incentivize more industries, such as agricultural biotech and climate technology, to adopt similar pooling strategies that embed a social return mandate into their core mission.⁴⁴⁶

CONCLUSION

Well-structured patent pools are highly effective at addressing the challenges of fragmented patent ownership. With converting scattered intellectual property into streamlined and transparent licensing frameworks, they have proven their value in various sectors. In the ICT industry, pools like those for H.264 and VVC have accelerated the adoption of new standards and fostered platform innovation. A different, yet equally impactful, model has emerged in global health through the Medicines Patent Pool (MPP) and C-TAP,⁴⁴⁷ which prioritize public good outcomes through non-exclusive licensing and knowledge transfer. Evidence from both sectors consistently shows that these pools boost innovation, increase market entry, and deliver significant health and economic benefits. However, the risk of anti-competitive behaviour,⁴⁴⁸ such as exclusion and royalty stacking, must be managed with careful design and regulatory oversight. Moving forward, the focus is on developing hybrid models that combine commercial licensing with public health mandates. Innovations like block-chain⁴⁴⁹ can also enhance

⁴⁴⁶ The Health Impact Fund illustrates how reward-based systems (dependent on documented health impact) can integrate with voluntary licensing and social return mandates.

⁴⁴⁷ C-TAP mirrored this model during COVID-19, using royalty free sublicenses and open tech transfer for diagnostics and vaccine components in LMICs using MPP's implementation platform.

⁴⁴⁸ RAND/FRAND policies and antitrust oversight—illustrated by U.S. cases and agency guidance are key to ensuring pools do not fix prices or exclude competitors.

⁴⁴⁹ Blockchain-based systems promise in-built audit trails, transparent royalty distribution and minimal transaction costs—qualities suitable for administering pooled IP under trust-enhanced structures.



trust and transparency in royalty distribution. As we face global challenges that require interdisciplinary solutions, the lessons learned from patent pools provide a valuable blueprint for creating inclusive, innovation-friendly licensing structures that can facilitate the rapid diffusion of critical technologies.



CHAPTER 15

FROM COLLABORATION TO CONTROL: THE LEGAL AND ECONOMIC DYNAMICS OF PATENT POOLS IN EMERGING TECH MARKETS

- Abhishek Chaurasia* and Nitya Singh**

ABSTRACT

Patent pools, though originally conceived as collaborative mechanisms to streamline access to critical technologies and reduce the burdens of fragmented licensing, have evolved into powerful legal and economic entities that shape the contours of innovation, particularly in high-technology sectors such as artificial intelligence, telecommunications, and the Internet of Things. While their structure is intended to foster cooperation among patent holders and licensees, the real-world functioning of many major pools reflects a growing tendency toward centralisation of control, opaque royalty models, and governance frameworks that frequently exclude smaller entities especially those based in emerging markets. This paper critically explores the shifting dynamics of patent pools through the dual lens of legal structure and economic impact. By undertaking a comparative study of well-established pools such as MPEG LA and Avanci, the research examines the underlying frameworks used for licensing, royalty determination, and participation, and how these often produce uneven outcomes for stakeholders from developing countries. The study further engages with antitrust implications and regulatory responses across jurisdictions, drawing from the approaches of the United States, European Union, and India to analyse how competition law is being used or at times avoided to navigate the risks posed by concentrated licensing power. Through a blend of doctrinal analysis, case-based review, and policy examination, this paper seeks to identify the extent to which patent pools genuinely facilitate inclusive innovation and access, or whether they increasingly serve as instruments of exclusion under the guise of collaboration.

KEYWORDS: Patent Pools, Inclusive Innovation, Exclusion, Collaboration, Transparent Models

INTRODUCTION

Patent pools are cooperative licensing agreements wherein multiple patent holders combine their intellectual property rights, enabling third parties to secure authorization for a group of patents through a single transaction. This concept originated in the early twentieth century as a pragmatic

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solution to the challenges posed by fragmented patent ownership, which often led to expensive litigation and slowed technological progress. By consolidating patents related to a particular technology or standard, patent pools aim to streamline the licensing process, reduce transaction costs, and expand access to essential innovations.

In recent years, patent pools have become gained particularly significance in high-technology sectors such as ‘fifth-generation wireless technology’ (5G), ‘artificial intelligence’ (AI), and the ‘Internet of Things’ (IoT). These industries are characterized by complex technologies that integrate numerous patented inventions held by multiple entities. As such, patent pools play a crucial role in enabling interoperability and accelerating innovation by offering implementers simplified access to the required standard essential patents (SEPs) under fair, reasonable, and non-discriminatory (FRAND) licensing terms. Despite their collaborative framework and intended role in fostering innovation, patent pools have raised concerns regarding their actual impact on market dynamics. The central issue is whether patent pools genuinely promote inclusive innovation by facilitating access and fair licensing or whether they have evolved into mechanisms that consolidate market control among dominant patent holders. This duality poses significant implications for competition law, innovation policy, and the equitable participation of smaller firms and innovators, particularly in emerging economies. This paper will critically examine this tension, exploring how patent pools influence both innovation ecosystems and market power in contemporary high-technology industries.

CONCEPTUAL FOUNDATIONS OF PATENT POOLS

LEGAL STRUCTURE AND OPERATIONAL MECHANISMS OF PATENT POOLS

Patent pools are complex contractual and licensing arrangements where multiple patent holders bring together their intellectual rights—especially those deemed essential to a technical standard—into a single collective licensing entity. This legal structure serves as a solution to the problem of fragmented patent ownership that can otherwise result in prolonged negotiations, increased litigation risk, and barriers to technology deployment.

In practice, patent pools operate through an administrator or a management organization that acts as the central licensor. This entity is responsible for vetting the essentiality of contributed patents, granting licenses to third parties (licensees), collecting royalties, and distribute revenues to participating patent holders based on pre-agreed formulas or patent valuations. The legal relationship between



patent holders and the pool administrator is typically governed by license agreements and contracts defining terms, governance, and dispute resolution mechanisms.

Participants in patent pools are primarily Standard Essential Patent (SEP) owners, whose patents are indispensable for implementing industry standards established by Standard Setting Organizations (SSOs). Licensees include manufacturers, service providers, and other technology implementers seeking to develop or sell products compliant with these standards. By providing a single access point to multiple patents, patent pools reduce the risks of infringement claims and promote interoperability across products and services.

The contractual nature of patent pools entails complex legal considerations, including the determination of patent essentiality, scope of licensed rights, royalty rates, and compliance with competition law to avoid anti-competitive conduct such as price fixing or market allocation.

‘FRAND’ LICENSING COMMITMENTS: LEGAL OBLIGATIONS AND ECONOMIC IMPACT

A fundamental aspect of licensing Standard Essential Patents (SEPs) within patent pools is the requirement of Fair, Reasonable, and Non-Discriminatory FRAND commitments. These undertakings are often made voluntarily by patent holders as part of their participation in SSOs and are increasingly enforced by courts and competition authorities globally.

Fairness requires that licensing terms avoid exploitative or oppressive conditions that would unduly burden licensees. Reasonableness dictates that royalties and other licensing terms reflect the true value of the patent contribution without inflating costs to an unsustainable level. Non-discrimination ensures equal treatment for similarly situated licensees, preventing preferential or exclusionary practices.

Legally, FRAND commitments are enforceable under contract law, patent law, and competition law. Together, these framework act as safeguards from exploiting their dominant position in essential technologies. Disputes over FRAND terms have led to landmark court rulings worldwide, continue to shape the jurisdiction on patent licensing and antitrust regulation. These principles serve to balance the rights of patent holders to receive adequate remuneration with the public interest in fostering broad and affordable access to standardized technologies.

ECONOMIC RATIONALE AND COMPETITION LAW CONSIDERATIONS

Economically, patent pools function as mechanism that promote efficiency in the marketplace. By uniting fragmented patent rights into a single licensing platform, they drastically cut down transaction



costs, decrease uncertainty, and simplify access to essential technologies. This is vital in industries characterized by a complex patent landscape—such as telecommunications, artificial intelligence, and the Internet of Things—where products depend on multiple interlinked patented innovations.

One of the major economic concern, addressed by patent pools is “royalty stacking,” where overlapping patent royalties accumulate, potentially making end products prohibitively expensive. Patent pools mitigate this problem by negotiating aggregated royalty rates, providing licensees with transparency and predictability regarding their financial obligations.

However, given their inherent potential to aggregate significant market power, patent pools must be carefully structured to comply with competition law. Antitrust authorities monitor pools to ensure they do not facilitate anti-competitive practices like price-fixing, exclusion of non-pool patent holders, or licensing terms that distort market competition that could harm competition. The interplay between patent rights and competition law remains a delicate balance requiring ongoing scrutiny and regulatory guidance.

INTERNATIONAL INTELLECTUAL PROPERTY AND COMPETITION LAW FRAMEWORKS ENDORISING PATENT POOLS

International legal frameworks recognize patent pools as a valuable mechanism to balance patent protection with innovation promotion and market fairness. The World Intellectual Property Organization (WIPO) expressly supports patent pools as collective rights management tools that enhance access to technology while emphasizing the demand of transparency, governance accountability, and equitable participation among patent holders.⁴⁵⁰

The Agreement on ‘Trade-Related Aspects of Intellectual Property Rights’ (TRIPS), administered by the World Trade Organization (WTO), establishes minimum standards for patent protection worldwide, promoting technological creation and transfer. TRIPS indirectly supports patent pooling by encouraging mechanisms that facilitate the dissemination of technology while respecting intellectual property rights, especially in developing countries.⁴⁵¹

⁴⁵⁰ World Intellectual Prop. Org., *Patent Pools and Collective Rights Management* 12–20 (2019), https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1047.pdf.

⁴⁵¹ Agreement on Trade-Related Aspects of Intellectual Prop. Rights [TRIPS], Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Org., Annex 1C, 1869 U.N.T.S. 299, https://www.wto.org/english/docs_e/legal_e/27-trips_01_e.htm.



Competition law guidelines from major jurisdictions the ‘United States Department of Justice’, the ‘Federal Trade Commission’, and the ‘European Commission’ provide detailed structure to assess the pro-competitive gain and potential risks of patent pools. These authorities endorse pools that enhance efficiency and innovation but scrutinize arrangements that may result in exclusionary conduct or market foreclosure. Collectively, these international and national frameworks create a regulatory environment that seeks to harness the collaborative potential of patent pools while safeguarding against abuse, thus promoting balanced innovation ecosystems globally.

PATENT POOLS IN PRACTICE: EXAMPLES AND GLOBAL MODELS

Patent pools are collaborative licensing mechanisms designed to consolidate patents held by multiple entities, especially when these patents are essential to implementing industry standards. By bundling these patents, pools simplify the process for licensees who would otherwise face the logistical and financial burden of negotiating with each patent holder separately. This section elaborates on prominent patent pools, their operational details in various sectors, their licensing frameworks, and critical considerations about transparency and inclusive.

PROMINENT PATENT POOLS: INDUSTRY ROLES AND OPERATIONAL MODELS

- **MPEG LA:** Established in the late 1990s, MPEG LA is one of the earliest and most prominent patent pools, primarily managing patents related to multimedia standards such as MPEG-2 and H.264/AVC. It aggregates patents from a diverse set of owners including multinational corporations, research institutions, and individual inventors. MPEG LA provides a single licensing agreement that covers the entire essential patent portfolio for these standards, which is crucial for manufacturers of consumer electronics (e.g., DVD players, smartphones, streaming devices). The licensing fees are generally calculated on a per-unit basis, where licensees pay a fixed royalty for each device or software instance sold. This predictable and standardized approach has greatly contributed to the widespread adoption of digital video technologies.
- **Avanci:** Avanci specializes in licensing patents essential for cellular communication standards (2G through 5G) and the IoT sector. It differentiates itself through an online, global licensing platform that offers patent licenses to diverse industries, including automotive, smart meters, and connected consumer devices. Avanci’s business model focuses on simplifying licensing through a single transaction that covers patents contributed by various owners, including



telecom companies and patent aggregators. Royalty structures commonly combine fixed per-unit fees with annual caps, reflecting sensitivity to varying production volumes and economic contexts. This model supports rapid and scalable deployment of connected technologies across global markets.

- **Via Licensing:** Via Licensing operates pools across different technology sectors such as wireless communications, audio codecs, and automotive telematics. It emphasizes governance transparency by maintaining a board of patent owners and independent members, who oversee licensing terms, royalty rates, and dispute resolution. Via Licensing's flexible licensing schemes include tiered royalty rates and volume-based discounts, accommodating the economic realities of both large-scale manufacturers and smaller enterprises. This flexibility is particularly important in industries where product scales vary widely.

LICENSING FRAMEWORKS AND PARTICIPATION CRITERIA

Participation in patent pools typically involves patent holders committing their patents declared essential to compliance with industry technical standards. These declarations are often made to Standard Setting Organizations (SSOs)⁴⁵², which require patent holders to license these patents on Fair, Reasonable, and Non-Discriminatory (FRAND) terms, thereby preventing anti-competitive conduct.

- **Verification of Essentiality:** Patent pools undertake technical and legal assessments to verify that patents included in the pool are indeed essential to the standard, thus guarding against “patent ambush” or the inclusion of non-essential patents intended to inflate royalties.
- **Bundled Licensing:** Licensees gain access to multiple patents via a single agreement, eliminating the inefficiency of negotiating multiple individual licenses. This bundling reduces transaction costs and legal risks, accelerating product development and market entry.
- **Royalties Structures:** Common royalties mechanisms include:
 - ‘Per-unit royalties’: Fixed fees charged per product sold or device using the patented technology.
 - ‘Percentage-based royalties’: Calculated as a percentage of the licensee's sales revenue or product price.

⁴⁵² European Commission, *Communication on Standard Essential Patents*, COM (2017) 712 final, at 7 (Nov. 29, 2017), <https://ec.europa.eu/docsroom/documents/26326> (last visited Aug. 3, 2025).



- ‘Tiered royalty rates’: Discounts applied as sales volumes increase, incentive's larger production runs.
- Licensing Terms: Agreements specify sub-license rights, territorial scope, duration, and enforcement mechanisms, offering legal clarity and ensuring compliance with competition laws.

TRANSPARENCY AND ACCESSIBILITY: INCLUSIVE FOR SMALLER ENTITIES AND THE GLOBAL SOUTH

While patent pools simplify licensing, the degree of transparency and accessibility varies and can significantly impact smaller companies and those in developing economies.

- Transparency: Pools like MPEG LA publicly disclose their patent portfolios, licensing terms, and fee schedules, enabling licensees to understand their obligations and plan accordingly. This transparency is crucial for informed participation and compliance.
- Affordability and Legal Complexity: Despite transparent fee structures, cumulative royalties from multiple patent pools or overlapping standards may create a financial barrier for startups or manufacturers in lower-income countries. The often-complex legal language of licensing agreements may require specialized legal advice, which can be prohibitively expensive for smaller entities.
- Innovative Licensing Platforms: Avanci’s online licensing system reduces administrative barriers by enabling quick, centralized licensing across multiple jurisdictions. This improves accessibility for companies in diverse geographic markets. However, fixed royalty fees may still pose challenges for companies in emerging economies, where cost sensitivity is higher.

SECTORAL APPLICATIONS AND CHALLENGES

- Telecommunications: Patent pools such as MPEG LA and Avanci have played instrumental roles in the global deployment of cellular standards (4G, 5G) and multimedia technologies, facilitating interoperability and innovation by managing complex SEP landscapes.
- Automotive Industry: As vehicles become more connected, relying heavily on cellular and sensor technologies, patent pools like Avanci help automotive manufacturers obtain the necessary licenses more efficiently.
- Artificial Intelligence and IoT: In rapidly evolving sectors like AI and IoT, patent pools are emerging as potential mechanisms to manage intellectual property rights related to machine



learning models, algorithms, and communication protocols. The rapid pace of innovation poses challenges in identifying essential patents and ensuring FRAND compliance, making patent pools both valuable and an area of ongoing legal scrutiny.

LEGAL AND ECONOMIC CONCERNS: ANTITRUST, ROYALTIES, AND MARKET POWER

Patent pools are collaborative arrangements where multiple patent holders aggregate their patents and offer a single licensing package. While these arrangements can reduce transaction costs and promote technological diffusion, they also raise significant legal and economic concerns, particularly around antitrust risks, royalty practices, and the exercise of market power. This section delves deeper into these challenges, illustrating the complexity of balancing innovation incentives with competition law and equitable market access.

ANTITRUST CHALLENGES: PRICE FIXING AND EXCLUSIVE LICENSING RISKS

From a competition law perspective, patent pools pose inherent antitrust risks due to the cooperative nature of the participating entities—often competitors—agreeing on licensing terms that affect downstream markets. One primary concern is that patent pools may be used to facilitate price fixing, where pool members agree to set royalty rates collectively, potentially inflating licensing costs for implementers. Such coordinated behavior can reduce market competition by fixing prices or terms in a way that harms consumers or rivals.

Another concern involves exclusive licensing arrangements or restrictive grant-back clauses within pools that could prevent non-members from accessing essential technologies or limit their ability to compete effectively. These practices risk creating entry barriers and reinforcing dominant positions. Therefore, antitrust authorities vigilantly assess whether pools function as legitimate efficiency-enhancing mechanisms or as vehicles for collusive conduct.

In the United States, the ⁴⁵³Federal Trade Commission’ (FTC) and ‘Department of Justice’ (DOJ) have issued guidelines emphasizing that while patent pools can improve efficiency, they must avoid anticompetitive practices. For example, the FTC’s 2011 report, *The Evolving IP Marketplace*, highlights the need for transparency in royalty rates and discourages exclusionary licensing conditions. Similarly,

⁴⁵³ Federal Trade Commission, *The Evolving IP Marketplace: Aligning Patent Notice and Remedies with Competition*, Report at 79–80 (Oct. 2011), <https://www.ftc.gov/reports/evolving-ip-marketplace-aligning-patent-notice-remedies-competition-report-federal-trade> (last visited Aug. 3, 2025).



in ⁴⁵⁴FTC v. Rambus Inc., the FTC condemned the deceptive non-disclosure of patents essential to standards, as such conduct distorts competition and undermines the integrity of patent pools and SSOs.

In the European Union, the European Commission scrutinizes patent pools under Article 101 of the Treaty on the ‘Functioning of the European Union’ (TFEU), which prohibits anticompetitive agreements.⁴⁵⁵ The Commission’s 2017 communication on standard essential patents stresses that pools must operate under FRAND terms to ensure fair competition and avoid abuse of dominant positions.

‘India’s Competition Commission’ (CCI) has also begun focusing on patent pools and SEPs. The CCI recognizes the dual role of patents in incentivizing innovation and the potential for dominant firms to abuse market power. Indian telecom sector investigations reveal the Commission’s insistence on FRAND adherence and scrutiny of royalty rates to prevent monopolistic licensing practices that could stifle competition and innovation in emerging markets.⁴⁵⁶

PATENT HOLD-UP AND HOLD-OUT: ECONOMIC IMPLICATIONS

Two interrelated phenomena challenge the SEP and patent pool ecosystem: patent hold-up and patent hold-out.

- Patent hold-up occurs when SEP holders exploit the fact that implementers have already adopted a standard to demand excessive royalties or onerous licensing terms. Because the patented technology is essential and embedded in products or services, implementers face significant switching costs, which the patent holder may leverage to extract supracompetitive returns. This situation can increase costs for manufacturers and consumers, delay product launches, and ultimately dampen innovation incentives.
- Patent hold-out, conversely, refers to the strategic refusal or delay by licensees in accepting royalty payments despite using patented technology. Licensees may use this tactic to negotiate lower fees or contest patent validity, causing uncertainty and litigation risks for patent holders. Hold-out behavior undermines the licensing system’s efficiency and may discourage investments in research and development.

⁴⁵⁴ FTC v. Rambus Inc., 2011 WL 5214452 (F.T.C. Nov. 10, 2011).

⁴⁵⁵ European Commission, *Communication on Standard Essential Patents*, COM (2017) 712 final (Nov. 29, 2017), <https://ec.europa.eu/docsroom/documents/26326> (last visited Aug. 3, 2025).

⁴⁵⁶ Competition Commission of India, *CCI Orders and Reports*, <https://www.cci.gov.in/> (last visited Aug. 3, 2025).



Patent pools ideally serve as tools to alleviate these problems by providing streamlined licensing frameworks with pre-agreed terms, thus reducing litigation risks and negotiation costs. However, when pools themselves impose high or unclear royalties or restrict licensing options, they risk exacerbating hold-up rather than mitigating it.

ROYALTY STACKING: BARRIER TO INNOVATION IN EMERGING ECONOMIES

Royalty stacking refers to the cumulative payment burden borne by manufacturers and innovators who must license multiple patents from different holders, often across several patent pools, to produce a single product. This accumulation can lead to excessive total royalties, which may surpass the product's profit margins.

For emerging economies and smaller firms, royalty stacking represents a significant barrier to innovation and market participation. High aggregate royalty fees can deter local enterprises from developing or deploying advanced technologies, limiting competition and slowing technological diffusion. Moreover, excessive royalty burdens can increase consumer prices and restrict access to new technologies.

International policymakers and competition authorities have recognized the dangers of unchecked royalty stacking. The World Intellectual Property Organization (WIPO) and the International Telecommunication Union (ITU) promote transparency and encourage fair royalty negotiations to mitigate stacking risks. The European Commission and U.S. agencies have also advocated for clearer licensing terms and caps on royalties to ensure affordability and accessibility.⁴⁵⁷

JURISDICTIONAL PERSPECTIVES: REGULATORY APPROACHES AND CASE LAWS

- India: The CCI has investigated SEP licensing in the telecom sector, emphasizing adherence to FRAND commitments to prevent abuse of dominance. Although India has limited direct case law on patent pools, its competition law framework under the Competition Act, 2002 provides tools to address anticompetitive licensing and market abuse.⁴⁵⁸
- United States: U.S. courts and agencies, including the FTC and DOJ, have addressed patent pool antitrust concerns through enforcement actions and policy guidelines. Cases such as ⁴⁵⁹In

⁴⁵⁷ World Intellectual Property Organization (WIPO), *Patent Pools and Licensing*, https://www.wipo.int/patents/en/topics/patent_pools.html (last visited Aug. 3, 2025).

⁴⁵⁸ Competition Act, No. 12 of 2002 (India)

⁴⁵⁹ *In re Dell Inc.*, 121 F.T.C. 616 (1996).



re Dell Inc. involve scrutiny of patent assertion entities and their licensing practices, focusing on preventing abuses of market power and promoting transparency.

- European Union: The European Commission actively enforces competition rules in the context of SEPs and patent pools. The Commission's decisions often focus on preventing abuse of dominant positions and ensuring that licensing complies with FRAND principles. For example, the *Microsoft v. Motorola* case set important precedents on reasonable royalty rates and licensing negotiations.⁴⁶⁰

EMERGING ECONOMIES AND INCLUSIVITY CHALLENGES IN PATENT POOLS

Patent pools have emerged as important mechanisms to facilitate access to essential patented technologies, especially in sectors characterized by rapid innovation such as telecommunications and digital technology. However, despite their intended purpose to simplify licensing and promote technology dissemination, patent pools often present significant challenges for emerging economies. These challenges stem from structural, economic, and policy-related factors that hinder equitable participation and inclusivity of developing countries, including India, South Asia, and African nations. This section analyzes these barriers in detail and discusses the broader implications on innovation ecosystems in these regions.

STRUCTURAL BARRIERS TO PARTICIPATION

One of the primary obstacles faced by emerging economies in accessing patent pools is the high cost of entry. Patent pools typically require licensees to pay upfront fees, minimum royalties, or cumulative royalties on bundled essential patents, regardless of the extent of actual use. For small and medium enterprises (SMEs) or startups in developing countries, these financial demands can be prohibitively expensive. Unlike large multinational corporations with deep financial reserves, many local firms lack the capital to engage competitively in such pools.

Moreover, governance structures of patent pools tend to be dominated by patent holders from developed countries, who control the majority of Standard Essential Patents (SEPs). This dominance translates into disproportionate influence over pool policies, royalty rates, and licensing terms. Consequently, firms and innovators from emerging markets often have little or no representation in

⁴⁶⁰ *Microsoft Corp. v. Motorola Inc.*, 884 F. Supp. 2d 885 (W.D. Wash. 2012).



decision-making bodies, limiting their ability to negotiate fair terms or shape access policies that consider local economic realities.

POLICY-LEVEL EXCLUSIONS AND LICENSING CHALLENGES

Beyond financial and governance barriers, policy frameworks in many developing countries do not adequately address the unique challenges of patent pool participation. While countries like India have developed national intellectual property strategies aimed at promoting innovation and improving access, implementation gaps remain.

The Department for Promotion of Industry and Internal Trade (DPIIT), India's nodal IP policy agency, has explicitly highlighted the need for "affordable and equitable access" to patented technologies.⁴⁶¹ The DPIIT's National Intellectual Property Rights Policy advocates for measures to enhance transparency in licensing agreements and promote alternative mechanisms like compulsory licensing where necessary. However, the practical application of these policies faces hurdles due to limited institutional capacity, lack of negotiation expertise among local firms, and absence of coordinated regional strategies.

In South Asia and Africa, these policy challenges are compounded by weak enforcement mechanisms and underdeveloped legal infrastructure. Without robust national IP frameworks and enforcement mechanisms, local innovators risk exclusion not only from patent pools but also from protection and recourse in cases of unfair licensing or disputes.

REGIONAL FOCUS: INDIA, SOUTH ASIA, AND AFRICA

- India: Despite having a growing innovation ecosystem and increasing patent filings, Indian firms, particularly startups and SMEs, find participation in global patent pools difficult. High royalty burdens and complex licensing terms often make it economically unviable for many to license essential technologies. This constrains their ability to develop competitive products, especially in advanced sectors like telecommunications and digital services. For example, Indian telecom companies have faced challenges negotiating FRAND-compliant terms from global SEP holders, resulting in litigation and regulatory interventions by the Competition Commission of India (CCI).

⁴⁶¹ Department for Promotion of Industry and Internal Trade (DPIIT), *National Intellectual Property Rights Policy*, 2016, https://dpiit.gov.in/sites/default/files/National_IPR_Policy_English.pdf (last visited Aug. 3, 2025).



- South Asia: Countries in this region share similar challenges, with limited domestic patent ownership and reliance on foreign technologies. The lack of regional patent pool frameworks or coordinated licensing policies further limits collective bargaining power, leaving local innovators vulnerable to high costs and exclusion.
- Africa: The situation in Africa is often more acute. Many African countries have limited patent infrastructure and low levels of domestic patenting activity. Access to essential technologies through patent pools is frequently hampered by high royalty stacking, lack of transparency, and exclusion from pool governance. These challenges impact critical sectors such as healthcare, renewable energy, and agriculture, where access to technology is vital for development.

Efforts by international organizations such as the ‘World Intellectual Property Organization’ (WIPO) and the African Regional Intellectual Property Organization (ARIPO) aim to build capacity and promote equitable access to patent licensing. However, progress is gradual, and systemic hurdles remain significant.⁴⁶²

IMPACT ON LOCAL INNOVATORS AND SMALL BUSINESSES⁴⁶³

The exclusionary practices and high-cost structures associated with patent pools have direct adverse effects on local innovators and small businesses in emerging economies. Many startups have reported abandoning projects or refraining from entering markets due to unaffordable licensing fees or the complexity of negotiating with multiple patent holders. This exclusion stifles entrepreneurship, limits technology transfer, and ultimately slows economic growth.

Additionally, excessive royalty stacking where a single product requires licensing from multiple patent holders compounds the financial strain. Emerging market firms, which often operate with limited margins, find it difficult to absorb these costs without passing them onto consumers, thus limiting affordability and market penetration.

POLICY RECOMMENDATIONS AND OBSERVATIONS

Recognizing these challenges, policy measures are increasingly focused on enhancing inclusivity and lowering barriers for emerging economies:

⁴⁶² African Regional Intellectual Property Organization (ARIPO), *About ARIPO*, <https://www.aripo.org/> (last visited Aug. 3, 2025).

⁴⁶³ Ministry of Commerce and Industry, Government of India, *Report on Innovation Ecosystem in India*, 2022, <https://commerce.gov.in/> (last visited Aug. 3, 2025).



- The DPIIT National IP Policy calls for increased transparency in patent licensing and supports the exploration of alternative licensing models, such as patent pools tailored for developing countries or regional collaboration frameworks that leverage collective bargaining power.
- Regional initiatives in South Asia are exploring harmonization of patent laws and shared licensing platforms to reduce fragmentation and costs.
- International agencies encourage capacity-building programs to improve legal expertise and negotiation skills among local firms.

Such measures are essential to foster a balanced IP ecosystem where patent pools serve as enablers of innovation rather than instruments of exclusion.

COMPARATIVE LEGAL AND POLICY FRAMEWORKS GOVERNING PATENT POOLS AND SEP LICENSING

The governance of patent pools and Standard Essential Patents (SEPs) is shaped by diverse legal and policy frameworks across major jurisdictions. These frameworks seek to balance incentivizing innovation with preventing anti-competitive practices. This section compares regulatory approaches in the United States, European Union, and India, focusing on their legal instruments, enforcement agencies, and notable observations. It concludes with a discussion on the prospects and challenges of harmonizing patent pool governance globally.

UNITED STATES: DOJ AND FTC GUIDELINES ON PATENT POOLS AND SEPs

In the United States, the regulation of patent pools and SEP licensing is primarily guided by the antitrust laws enforced by the Department of Justice (DOJ) and the Federal Trade Commission (FTC). Both agencies have articulated policies to ensure patent pools promote efficiency without suppressing competition.

The Antitrust Guidelines for the Licensing of Intellectual Property (2017)⁴⁶⁴ issued jointly by the DOJ and FTC emphasize that patent pools can reduce transaction costs, avoid litigation, and facilitate innovation, provided they avoid exclusionary practices or price fixing. The guidelines require transparency in licensing terms and prohibit restrictive clauses that hinder competition. For example, the agencies discourage arrangements that limit participation in the pool or impose excessive royalty stacking burdens on licensees.

⁴⁶⁴ U.S. Dep't of Justice & Fed. Trade Comm'n, *Antitrust Guidelines for the Licensing of Intellectual Property* 19–23 (2017), <https://www.justice.gov/atr/IPguidelines/download> (last visited Aug. 3, 2025).



The U.S. antitrust enforcement agencies have actively scrutinized SEP licensing behaviors. Cases such as *FTC v. Qualcomm*⁴⁶⁵ underscore the need to balance the monopoly power conferred by SEPs with fair licensing practices. Courts and regulators insist on licensing under Fair, Reasonable, and Non-Discriminatory (FRAND) terms to prevent abuses such as patent hold-up or excessive royalties.

EUROPEAN UNION: COMPETITION LAW AND ANTITRUST ENFORCEMENT

The European Union regulates patent pools and SEP licensing primarily under Article 101 and Article 102 of the Treaty on the Functioning of the European Union (TFEU), which prohibit anti-competitive agreements and abuse of dominant market positions, respectively.

The European Commission (EC) has published guidance on the treatment of SEPs and patent pools in the context of competition law.⁴⁶⁶ The 2017 Communication on Standard Essential Patents highlights the necessity for SEP holders to commit to licensing on FRAND terms and cautions against practices that could restrict market access or harm innovation.

The EC has intervened in several high-profile cases involving SEP licensing, such as *Microsoft v. Motorola*⁴⁶⁷ and *Samsung v. Apple*, setting precedents on the appropriate calculation of royalties and the duty to negotiate licensing agreements in good faith. The Commission also stresses the importance of transparency and non-discrimination in patent pool governance, aiming to ensure accessibility for all market participants, including smaller firms and newcomers.

INDIA: COMPETITION ACT, CCI OBSERVATIONS, AND REGULATORY STANCE

India's regulatory framework for patent pools is primarily governed by the Competition Act, 2002, enforced by the Competition Commission of India (CCI).⁴⁶⁸ Although India's jurisprudence on patent pools is still evolving, the CCI has increasingly focused on SEP licensing in key sectors like telecommunications. The CCI has issued observations underscoring the need for adherence to FRAND commitments to avoid abuse of dominance by SEP holders. In telecom investigations, the Commission has scrutinized royalty rates and licensing conditions to ensure they do not impede market competition or innovation in the Indian context.

⁴⁶⁵ *FTC v. Qualcomm Inc.*, 969 F.3d 974 (9th Cir. 2020).

⁴⁶⁶ European Commission, *Communication on Standard Essential Patents*, COM (2017) 712 final (Nov. 29, 2017), <https://ec.europa.eu/docsroom/documents/26326> (last visited Aug. 3, 2025).

⁴⁶⁷ *Microsoft Corp. v. Motorola Inc.*, 884 F. Supp. 2d 885 (W.D. Wash. 2012).

⁴⁶⁸ Competition Commission of India, *CCI Order in Telecom SEP Investigation*, Case No. 12 of 2020, <https://www.cci.gov.in/> (last visited Aug. 3, 2025).



Additionally, India's Department for Promotion of Industry and Internal Trade (DPIIT) supports policies that encourage affordable access to patented technologies and promotes strengthening domestic innovation capabilities. Indian policy frameworks advocate for balanced IP governance that aligns with competition objectives and public interest considerations.⁴⁶⁹

HARMONIZATION OF GLOBAL PATENT POOL PRACTICES: POSSIBILITIES AND CHALLENGES

Given the transnational nature of technology markets and patent rights, harmonization of patent pool governance across jurisdictions presents both opportunities and challenges.

- **Prospects:** Harmonization could reduce legal uncertainty, lower transaction costs, and promote global innovation by establishing common standards for transparency, FRAND licensing, and dispute resolution. International organizations such as the World Intellectual Property Organization (WIPO) and the World Trade Organization (WTO) have advocated for enhanced cooperation on intellectual property governance, including patent pools.
- **Challenges:** Divergent legal traditions, economic priorities, and levels of development complicate harmonization efforts. For instance, competition law enforcement differs between the U.S. focus on market effects and the EU's emphasis on dominance and abuse. Emerging economies like India also prioritize access and affordability, which may require tailored approaches. Reconciling these differences while respecting national sovereignty over IP policy remains a complex task.

Thus, while global harmonization is desirable in principle to facilitate efficient technology transfer and fair licensing, it must be pursued with sensitivity to jurisdiction-specific contexts and needs.

REFORM AND RECOMMENDATIONS: TOWARDS INCLUSIVE, TRANSPARENT, AND EQUITABLE PATENT POOL GOVERNANCE

The growing concentration of technological power in global patent pools has prompted urgent discourse around their reform. While patent pools are theoretically designed to lower licensing costs, reduce litigation, and stimulate innovation, their actual impact on access and equity—particularly in the Global South—has been uneven. This section outlines concrete and practical reforms to enhance the inclusivity, transparency, and accountability of patent pools, in line with competition law

⁴⁶⁹ Department for Promotion of Industry and Internal Trade (DPIIT), *National Intellectual Property Rights Policy* (2016), https://dpiit.gov.in/sites/default/files/National_IPR_Policy_English.pdf (last visited Aug. 3, 2025).



principles, sustainable development goals (SDGs), and the foundational equity principles of intellectual property (IP) law.

TRANSPARENT ROYALTY MODELS AND DISCLOSURE OBLIGATIONS

One of the most critical reforms lies in the adoption of transparent and standardized royalty-setting mechanisms. At present, the opacity in royalty determination often results in royalty stacking, discriminatory pricing, and exclusion of low-income licensees. A reformed model should include:

- Public disclosure of licensing terms, including per-unit royalty rates and the total number of patents licensed under the pool.
- Royalty caps or sliding scale royalties for licensees from developing economies or small enterprises.
- Open audits of pool operations, with periodic publication of financial and governance reports.

These reforms will not only ensure compliance with FRAND obligations but also reinforce the non-discrimination principle embedded in most global competition regimes.

INDEPENDENT THIRD-PARTY GOVERNANCE STRUCTURES

To mitigate conflicts of interest among dominant SEP holders, independent, neutral bodies should oversee the formation and operation of patent pools. Current self-governed models tend to prioritize the interests of founding members, often at the cost of fairness for other stakeholders.

Reforms should include:

- Appointing independent technical and legal experts (possibly from academia or regulatory bodies) as part of oversight boards.
- Mandating that governance decisions such as royalty rates and admission criteria be subject to review by neutral institutions or regulators.
- Allowing competition authorities to conduct periodic compliance reviews under national and international antitrust standards.

Such structures can prevent cartel-like behavior and maintain the competitive neutrality of patent pools.

ENHANCED PARTICIPATION OF GLOBAL SOUTH IN POOL MANAGEMENT

Given that many emerging economies are now hubs of technological development, particularly in sectors like healthcare, telecommunications, and agriculture, it is essential to ensure representation from the Global South in pool governance.



Concrete steps include:

- Reserving seats for representatives from developing countries' governments, SMEs, and civil society organizations.
- Setting up regional patent pool networks in South Asia, Africa, and Latin America, backed by local innovation policies and industry consortia.
- Facilitating capacity-building programs through organizations such as WIPO, ARIPO, or the South Centre to train negotiators and technical experts in SEP-related licensing and competition law.

Such representation will democratize access to innovation, reduce North-South dependency, and support inclusive technology transfer.

LOCALIZED LICENSING MODELS AND OPEN INNOVATION POLICIES

Another key reform is the promotion of localized licensing schemes, especially for public-interest technologies like medical devices, green tech, and education tools. These schemes could include:

- Differential pricing models based on economic status of the licensee's region.
- Technology pools funded or incentivized by national governments for use in public welfare sectors.
- Integration with open innovation platforms, such as the WHO COVID-19 Technology Access Pool (C-TAP) or open-source AI standards.

These practices can bridge the innovation divide and promote knowledge equity; a principle embedded in the SDGs and international development agendas.

CONCLUSION

This paper, examined the legal and economic dimensions of patent pools, particularly their role in SEP licensing across high-tech industries. While originally intended to facilitate collaborative innovation, patent pools often reinforce structural inequities marked by opaque royalty structures, dominance by a few SEP holders, and limited inclusion of Global South stakeholders. Comparative insights from the U.S., EU, and India revealed fragmented regulatory approaches and underscored the need for balanced governance. To address these gaps, the paper proposed reforms including transparent licensing practices, independent oversight, and region-specific participation mechanisms. Ultimately, patent pools must evolve from formal collaboration frameworks into truly inclusive



platforms that serve both innovation and equitable development. With better governance and broader representation, they can play a transformative role in bridging the global technology divide.



CHAPTER 16

BALANCING INNOVATION AND ACCESS: THE ROLE OF FRAND LICENSING AND COMPETITION LAW IN SHAPING THE SOUTH ASIAN SEP LANDSCAPE FOR 5G AND AI TECHNOLOGIES

- Dinesh PK*

ABSTRACT

This paper examines the definite relationship between Standard Essential Patents, FRAND (Fair, Reasonable, and Non-Discriminatory) licensing, and competition law, with a particular focus on their evolving systems within the South Asian Intellectual Property landscape. As 5G and Artificial Intelligence technologies become increasingly available, the economic significance of SEPs have increased, leading to bigger disputes over licensing terms, patent hold-up concerns, and the effective enforcement of intellectual property rights. Drawing on recent jurisprudential developments, including landmark cases in India, and the wide global policy discourse, this research analyses how South Asian jurisdictions are navigating the challenges of ensuring equitable access to standardized technologies while simultaneously fostering innovation. The paper examines the effectiveness of current FRAND determinations and explores the increasing role of competition authorities in checking potential abuses of market power by SEP holders. It further assesses the royalty stacking, the challenges of determining right royalty rates for complex value chains, and the efforts towards more transparent and efficient licensing mechanisms, such as patent pools. Ultimately, this paper aims to provide actionable insights for policymakers, industry stakeholders, and legal practitioners in South Asia, proposing a balanced framework that improves technological advancement through patent protection, promotes fair competition, and ensures widespread access to essential technologies needed for regional and global economic growth.

KEYWORDS: Standard Essential Patents, FRAND Licensing, Competition Law, 5G Technologies

INTRODUCTION

The intersection of Standard Essential Patents SEPs, Fair, Reasonable, and Non-Discriminatory (FRAND) licensing, and competition law has become complex as 5G and artificial intelligence

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technologies drive unmatched connectivity and innovation across South Asia. This research examines how South Asian jurisdictions, particularly in India, are navigating the balance between protection of intellectual property rights and ensuring competitive markets, while addressing the unique challenges posed by emerging technologies. This work reveals that while India has developed a relatively reliable SEP enforcement framework favouring patent holders where broader regional harmonization remains limited, which creates potential barriers to technological adoption and cross border innovation collaboration.

THE EVOLUTION OF SEPs IN SOUTH ASIA: FROM TELECOMMUNICATIONS TO AI INTEGRATION

Historical Development And Regional Context

The concept of Standard Essential Patents emerged in South Asia recently, with India leading the regional development since 2011 when Ericsson first challenged handset imports by Kingtech Electronics over AMR Codec technology infringement. This case marked the beginning of what would become a rapidly evolving landscape of SEP litigation across the region. South Asia's approach to SEPs has been shaped by its position as both a major consumer market and an emerging innovation hub. With India hosting the world's second-largest telecom market of 1.2 billion subscribers and Pakistan, Bangladesh, and other regional economies experiencing rapid digital transformation, the stakes for SEP licensing have grown. The region's unique characteristics including large populations with diverse economic conditions, domestic innovation ecosystems, and significant dependence on technology imports have created distinct challenges for implementing global SEP frameworks.⁴⁷⁰

The Regional Patent Filing Surge

Recent data indicates that South Asian countries are increasingly participating in global patent filing activities, with India securing the eighth rank globally for first-time patent filings. This reflects the region's growing technological capabilities, particularly in telecommunications, software, and emerging AI applications. However, the concentration of SEP holdings remains heavily distorted toward established multinational corporations, creating unequal bargaining systems that competition authorities are increasingly investigating.⁴⁷¹

⁴⁷⁰ Maheshwari & Co., "Standard Essential Patents (SEPs) in India | Key Recent Rulings," accessed August 8, 2025

⁴⁷¹ Rouse, "Interpreting FRAND in Southeast Asia – new SEP battle grounds," accessed August 8, 2025.



The existing 5G networks across South Asia has accelerated SEP-related disputes, with patent litigation increasing by 40% year-over-year according to recent industry reports. This surge includes not only traditional telecommunications patents but also cross-industry applications where 5G enables AI-powered solutions in healthcare, automotive, and industrial IoT sectors.⁴⁷²

Technological Convergence and Cross-Industry Implications

The 5G and AI technologies has fundamentally altered the SEP landscape in South Asia. Unlike previous generations of mobile technology that primarily affected telecommunications companies, 5G-enabled AI applications are spread across multiple industries, creating new categories of standard essential patents and complex licensing scenarios.⁴⁷³ Artificial intelligence applications increasingly rely on communication protocols for data transmission, edge computing, and real-time processing capabilities. This means that companies previously uninvolved in telecommunications such as healthcare technology firms, automotive manufacturers, and industrial automation providers now require licenses for SEPs. The complexity is further increased by the fact that AI algorithms themselves may be subject to standardization, potentially creating new categories of SEPs in areas like neural network architectures and machine learning protocols⁴⁷⁴.

FRAND LICENSING FRAMEWORK IN SOUTH ASIA: JUDICIAL EVOLUTION AND REGIONAL VARIATIONS

India's Judicial Leadership in FRAND Interpretation

Indian courts have emerged as the primary architects of FRAND licensing principles in South Asia, developing new approaches to balance patent holder rights with implementer access needs. The Delhi High Court's jurisprudence reveals several key principles that have shaped regional understanding of FRAND obligations.

Good Faith Negotiations as Foundation

⁴⁷² Global Legal Post, Xiaomi hit by FRAND lawsuits in France and India, <https://www.globallegalpost.com/news/xiaomi-hit-by-frand-lawsuits-in-france-and-india-485466322> (last visited Aug. 8, 2025).

⁴⁷³ Amber Darr, *Competition Law in South Asia: Policy Diffusion and Transfer* (Cambridge Univ. Press 2023), <https://ccijournal.in/index.php/ccijoelp/article/download/190/80/994> (last visited Aug. 8, 2025).

⁴⁷⁴ Standard Essential Patent Landscape in India – Part 1," published by the European Innovation Council and SMEs Executive Agency on January 4, 2024.



Indian courts consistently emphasize that FRAND licensing must be grounded in good faith negotiations between willing licensors and licensees. The landmark *Ericsson v. Lava* (2024)⁴⁷⁵ case established that implementers must demonstrate genuine willingness to obtain licenses, rather than engaging in delay tactics or opportunistic litigation. The court characterized Lava as an "unwilling licensee" based on its pattern of prolonged negotiations without constructive counter offers, setting a precedent that prioritizes substantive engagement over procedural compliance.

This emphasis on good faith extends beyond mere willingness to negotiate. In *Intex v. Ericsson* 2023⁴⁷⁶, the court found that filing competition law complaints while simultaneously refusing to engage meaningfully in licensing discussions constituted bad faith behaviour. Such decisions reflect the judiciary's recognition that SEP licensing requires balanced reciprocal obligations rather than one-sided demands for access.

Royalty Determination and Comparable Licensing

The evolution of FRAND royalty determination in India demonstrates increasingly developed economic analysis. Courts have consistently adopted the "comparable licensing approach," examining existing license agreements with similarly situated parties to establish appropriate royalty ranges. This methodology reflects international best practices while accounting for local market conditions and competitive dynamics.⁴⁷⁷

Significantly, Indian courts have endorsed end-product pricing as the basis for royalty calculations, rejecting arguments for component-level licensing in cases like *Ericsson v. Lava*, where the court set FRAND rates at 1.05% of device net selling price. This approach recognizes that telecommunications connectivity represents core functionality for mobile devices, justifying royalties based on overall product value rather than individual component contributions.

Portfolio Licensing And Administrative Efficiency

The judicial acceptance of portfolio licensing represents another important development in India's FRAND framework. Rather than requiring patent-by-patent licensing negotiations, courts have recognized that portfolio licensing reduces transaction costs and administrative complexity while

⁴⁷⁵ *Telefonktiebolaget Lm Ericsson v. Lava International Ltd.*, CS(COMM) 1148/2016, 2024: DHC:2698 (Delhi High Ct. Mar. 28, 2024)

⁴⁷⁶ *Intex Technologies (India) Ltd. v. Telefonaktiebolaget L.M. Ericsson*, FAO (OS) (COMM) 296/2018, 2023: DHC:2243-DB (Delhi High Ct. Mar. 29, 2023).

⁴⁷⁷ Rahul Jain & Rushika Bakshi, *Comprehensive Analysis of SEP Litigation: Understanding Anti-Suit Injunctions and FRAND Licensing in India & USA*, Hammurabi & Solomon Partners (2024)



providing implementers with comprehensive access to essential technologies. This approach aligns with global industry practices and acknowledges the practical realities of modern technology implementation.

Regional Variations And Development Gaps

While India has developed a relatively comprehensive SEP framework, other South Asian jurisdictions lag significantly in both legal infrastructure and practical experience with SEP disputes. Pakistan's competition law framework, established through the Competition Ordinance 2010, provides theoretical jurisdiction over SEP-related matters but lacks practical precedent or specialized expertise. The country's recent accession to the Madrid Protocol in 2021 represents progress in intellectual property harmonization, but when it comes to SEPs it remains limited.

Bangladesh presents an even more fresh framework, with competition legislation adopted only in 2012 and limited operational capacity for complex patent disputes. The absence of specialized IP courts and limited judicial experience with technology standards creates significant uncertainty for both patent holders and implementers operating in the Bangladeshi market.

Nepal's patent system, governed by the Patent, Design and Trade Marks Act 1965, provides only basic patent protection with seven-year terms and limited enforcement mechanisms. The absence of PCT membership and limited examination procedures make Nepal particularly challenging for SEP enforcement and FRAND licensing negotiations.

COMPETITION LAW AND SEP REGULATION: JURISDICTIONAL TENSIONS AND ENFORCEMENT CHALLENGES

The India Model: CCI Jurisdiction And Patent Act Supremacy

The relationship between intellectual property rights and competition law has been particularly contentious in India, where the Competition Commission of India (CCI) initially asserted jurisdiction over SEP licensing disputes before facing judicial limitations on its authority.

Jurisdictional Evolution And Current Framework

The 2023 Delhi High Court decision in *Telefonaktiebolaget LM Ericsson PUBL v. Competition Commission of India*⁴⁷⁸ altered the landscape by holding that patent-related disputes fall primarily under the Patents Act 1970 rather than the Competition Act 2002. This ruling reversed earlier

⁴⁷⁸ *Telefonaktiebolaget LM Ericsson (PUBL) v. Competition Commission of India*, LPA 246/2016, 2023: DHC:4783-DB (Delhi High Ct. July 13, 2023).



decisions that had allowed concurrent jurisdiction, establishing the Patents Act as *lex specialis* governing patent holder conduct.

The jurisdictional limitation reflects broader tensions between intellectual property exclusivity and competition law objectives. While IP rights inherently create temporary monopolies to increase innovation, competition law seeks to prevent abuse of market power and ensure competitive markets. The court's resolution prioritizes patent law's specific provisions while acknowledging that patent holders remain subject to general competition law principles when their conduct extends beyond legitimate IP exercise.

Implications For SEP Enforcement

The jurisdictional clarity has significant implications for SEP enforcement strategies and regulatory oversight. Patent holders can now pursue licensing disputes primarily through patent law mechanisms, including infringement actions and FRAND rate determinations, without the same going with CCI investigations. This streamlined approach reduces regulatory uncertainty and litigation costs while potentially limiting competition law oversight of licensing practices.

However, critics argue that restricting CCI jurisdiction may inadequately address genuine competition concerns arising from SEP licensing, particularly regarding market foreclosure, price discrimination, and coordinated effects among patent pools. The balance between IP protection and competition oversight remains an evolving challenge requiring careful directives to ensure neither innovation incentives nor competitive markets being compromised.⁴⁷⁹

REGIONAL COMPETITION LAW FRAMEWORKS

The comparative analysis reveals significant disparities in institutional capabilities and regulatory approaches to IP and competition interfaces.

Pakistan's Emerging Framework

Pakistan's Competition Commission, established in 2007, has developed basic institutional capacity but lacks specific experience with SEP-related matters. The country's competition law includes general provisions addressing abuse of dominance and anti-competitive agreements, but application to patent licensing scenarios remains largely untested. Recent policy discussions have indicated growing awareness of IP-competition issues, but practical guidance and enforcement precedent are still lacking.

⁴⁷⁹ Navigating SEP Licensing: Insights from Indian Jurisprudence," published in December 2024 by the Indian Council for Research on International Economic Relations (ICRIER).



Bangladesh And Smaller Economies

Bangladesh demonstrates the challenges facing smaller South Asian economies in developing effective competition oversight of IP matters. Despite adopting competition legislation in 2012, the Bangladesh Competition Commission has focused primarily on traditional market conduct issues rather than complex IP licensing scenarios. Limited resources, technical expertise, and institutional capacity limit the commission's ability to address developed and recent SEP disputes.

Similar issues affect Nepal, Sri Lanka, and other regional economies where competition authorities exist primarily on paper with minimal operational capacity. The absence of specialized IP-competition expertise creates gaps that may disadvantage both innovators and implementers depending on market circumstances.

5G AND AI NEW FRONTIERS FOR SEP CHALLENGES IN SOUTH ASIA

Technology Convergence and Patent Complexity

The deployment of 5G networks across South Asia has introduced unprecedented complexity to SEP licensing negotiations and competition law analysis. Unlike previous mobile generations that affected primarily telecommunications companies, 5G enables cross-industry applications that implicate diverse sectors from healthcare to manufacturing.

Cross-Industry SEP Implications

Artificial intelligence applications increasingly depend on 5G connectivity for real-time data processing, edge computing, and distributed learning capabilities. This technological convergence means that AI companies, automotive manufacturers, healthcare providers, and industrial automation firms now require SEP licenses for technologies previously relevant only to telecommunications equipment vendors. This expansion creates new categories for potentially essential patents covering AI-specific implementations of standardized technologies. For example, neural network optimization algorithms designed for 5G edge computing environments may also qualify as SEPs if they become essential for standard-compliant AI deployment. Similarly, automotive AI systems requiring vehicle-to-everything (V2X) communication capabilities must implement 5G standards, potentially triggering SEP licensing obligations.

Regional Innovation and Standardization Participation



South Asian companies are increasingly participating in global standardization processes, particularly through organizations like the Third Generation Partnership Project - 3GPP and International Telecommunication Union - ITU. India's Telecommunications Standards Development Society TSDSI has emerged as an important regional voice in 5G standardization, while companies like Reliance Jio have contributed technical proposals for 5G Advanced features.

This growing participation creates opportunities for South Asian innovators to develop their own SEPs, potentially bringing changes in regional bargaining from predominantly licensing-fee payers to balanced licensor-licensee relationships. However, this transition requires sustained investment in research and development, strategic patent filing, and active engagement with international standardization bodies.

AI-SPECIFIC FRAND CHALLENGES

The integration of artificial intelligence technologies with standardized communication systems creates novel challenges for FRAND licensing that existing frameworks may inadequately address.

Algorithm Standardization and Patent Scope

As AI algorithms may include the standardization for interoperability and performance optimization, questions may arise regarding the scope of patent protection and FRAND obligations. Unlike traditional hardware patents with clear physical implementations, AI patents may cover mathematical algorithms, training methodologies, or optimization techniques that resist conventional licensing approaches.

The challenge gets intense when AI systems operate across multiple standardized domains simultaneously. For example, an autonomous vehicle AI system might require licenses for 5G communication protocols, sensor data fusion standards, and vehicle control system specifications. Coordinating FRAND licensing across these diverse technological domains requires new frameworks and potentially novel collective licensing mechanisms.

Data And Training Requirements

AI patent licensing faces unique complications regarding training data access and algorithmic transparency. Standard essential AI patents might require implementers to use specific training methodologies or data formats, creating dependencies that extend beyond traditional patent licensing



relationships. Competition law analysis must consider whether such requirements constitute legitimate patent scope or potentially anti-competitive tying arrangements.

Comparative Analysis Of South Asian Jurisdictions: Divergent Approaches And Harmonization Challenges

This analysis of South Asian SEP frameworks reveals the differences in institutional capacity, legal infrastructure, and practical enforcement capabilities across the region.

India's sophisticated judicial approach to SEP disputes, comprehensive patent law framework, and active competition authority establish it as the regional leader in addressing complex IP competition intersections. The Delhi High Court's specialized IP division has developed expertise in handling technically complex SEP cases, while the patent office maintains examination capacity for emerging technology applications.

The Indian framework benefits from several institutional advantages such as specialized IP courts with technically trained judges, active participation in international patent cooperation treaties, comprehensive competition law framework with enforcement experience and growing domestic innovation ecosystem requiring balanced IP protection.

Pakistan's Intermediate Development

Pakistan occupies a middle position with basic institutional infrastructure but limited practical experience. The country's intellectual property organization provides patent examination and registration services, while the competition commission maintains theoretical jurisdiction over IP related matters. However, the absence of SEP-specific precedent and limited judicial experience with complex technology standards creates uncertainty for both patent holders and implementers.

Regional And Development Priorities

Bangladesh, Nepal, Sri Lanka, and smaller regional economies face substantial challenges in developing effective SEP governance frameworks. Limited resources, competing development priorities, and small domestic markets constrain investment in specialized IP infrastructure. These jurisdictions often rely on regional cooperation mechanisms and bilateral agreements to address complex IP matters beyond their individual institutional capacities.

HARMONIZATION OPPORTUNITIES AND CHALLENGES

South Asian Association For Regional Cooperation SAARC Framework



The SAARC framework provides potential mechanisms for regional harmonization of SEP governance approaches, particularly through intellectual property cooperation agreements and technical assistance programs. However, political tensions between member states and limited institutional capacity have hindered substantive progress in IP harmonization.

Regional organizations like the South Asia Cooperative Environment Programme - SACEP demonstrate potential models for technical cooperation that could extend to IP governance. SACEP's experience coordinating policy development across diverse national frameworks offers lessons for potential SEP governance harmonization initiatives.

Economic Integration and Trade Implications

The South Asia Free Trade Area - SAFTA creates economic integration pressures that may drive eventual IP harmonization, particularly as cross-border technology trade increases. However, the current disparities in SEP governance create potential trade barriers and competitive distortions that undermine regional integration objectives.

Companies operating across multiple South Asian markets face separated regulatory environments requiring diverse compliance strategies and potentially duplicative licensing negotiations. This fragmentation increases transaction costs and may discourage regional technology deployment, particularly for smaller companies lacking resources for multi-jurisdictional legal strategies.

POLICY RECOMMENDATIONS TOWARDS BALANCED AND HARMONIZED REGIONAL FRAMEWORKS

Strengthening Institutional Capacity

South Asian countries should consider establishing specialized SEP tribunals or enhancing existing IP court capabilities to handle complex technology standardization disputes. India's experience with the Delhi High Court's IP division provides a successful model that could be adapted to regional circumstances and resource constraints.

The tribunal framework should incorporate the following,

- Technical expertise in telecommunications and AI standards
- Economic analysis capabilities for FRAND royalty determination
- International coordination mechanisms for multi-jurisdictional disputes
- Expedited procedures for time-sensitive technology deployment



Competition Authority Coordination

Regional competition authorities should develop coordinated approaches to SEP-related competition issues, potentially through SAARC or bilateral cooperation agreements. Sharing enforcement experience, technical expertise, and market analysis capabilities could strengthen individual jurisdictions' capacity to address complex IP-competition intersections.

The coordination framework should address these,

- Information sharing protocols for cross-border investigations.
- Harmonized analytical frameworks for SEP competition assessment.
- Joint enforcement capabilities for regional market conduct.
- Technical assistance for capacity building in smaller jurisdictions.

INNOVATION ECOSYSTEM SUPPORT

SME And Startup Access Mechanisms

South Asian countries should develop specific mechanisms to support small and medium enterprises SMEs and startups in accessing SEP licenses and participating in standardization processes. India's proposed collective licensing entity for startups and educational institutions provides one model for reducing transaction costs and enabling broader participation.

Recommended mechanisms could include,

- Patent pools specifically designed for SME access
- Subsidized licensing programs for qualifying startups
- Technical assistance for standardization participation and
- Collective bargaining frameworks to balance negotiating power.

Countries should explore regional innovation cooperation mechanisms that leverage collective resources for standardization participation and SEP development. Collaborative research programs, joint patent filing initiatives, and shared standardization representation could strengthen the region's position in global technology governance.

FRAND FRAMEWORK HARMONIZATION

Common Principles and Procedures

South Asian jurisdictions should work toward harmonized FRAND licensing principles and procedures that provide predictability for both patent holders and implementers operating across



regional markets. This harmonization should build on India's judicial developments while accommodating diverse economic conditions and institutional capacities.

Key harmonization elements should include,

- Standardized good faith negotiation requirements.
- Comparable methodologies for royalty determination.
- Consistent approaches to willing licensee assessment.
- Coordinated enforcement mechanisms for cross-border disputes.

Technology Specific Adaptations

The framework should specifically address challenges posed by AI and other emerging technologies that may require novel licensing approaches. This includes guidance on algorithm patentability, data access requirements, and competition law analysis of AI-specific licensing practices.

CONCLUSION

The South Asian Standard Essential Patent landscape represents a sample of global tensions between intellectual property protection and competitive market access, complicated by the region's unique position as both a major technology consumer market and emerging innovation hub. India's judicial leadership in developing sophisticated FRAND licensing principles provides a foundation for regional development, but significant harmonization challenges remain across diverse national frameworks and institutional capacities. The emergence of 5G and AI technologies has fundamentally transformed the SEP landscape, creating cross-industry licensing obligations and novel competition law challenges that existing frameworks struggle to address. South Asian countries must adapt their regulatory approaches to accommodate technological convergence while ensuring that innovation incentives and competitive markets are appropriately balanced. The regional analysis reveals both opportunities and challenges for harmonized SEP governance. While institutional disparities and limited resources limit the immediate coordination possibilities, growing economic integration and shared technology challenges create pressures for eventual convergence. Success will require sustained commitment to capacity building, institutional cooperation, and adaptive regulatory frameworks that can evolve with technological change. Looking forward, South Asia's approach to SEP governance will significantly influence global technology access, innovation incentives, and competitive dynamics in crucial sectors from telecommunications to artificial intelligence. The region's choices regarding FRAND licensing



principles, competition law enforcement, and international cooperation will help determine whether emerging technologies serve as drivers of inclusive economic growth or sources of increased inequality and market concentration. The stakes extend beyond mere legal and economic considerations to encompass broader questions of technological sovereignty, innovation capacity, and regional cooperation in an increasingly connected global economy. South Asian countries that successfully balance patent holder rights with competitive market access while fostering domestic innovation capabilities will be best positioned to capture the benefits of the ongoing technological transformation while avoiding its potential pitfalls.



CHAPTER 17

STANDARD-ESSENTIAL PATENTS AND THE DEVELOPING ECONOMIES: TOWARDS A MORE FRANDLY FUTURE

- Darshita Srivastava* and Pratyush Pandey**

ABSTRACT

Patents are territorial in nature but technology especially in today's interconnected world driven by the Internet of Things (IoT) – is inherently global. As IoT is no more an idea on the horizon rather a prevailing reality the significance of Standard-Essential Patents (SEPs) in ensuring seamless technological interoperability across diverse devices and platforms has risen sharply. However, persistent challenges such as the monopolistic practices by SEP holders, the ambiguities around the FRAND (Fair, Reasonable, and Non-Discriminatory) licensing terms, strategic hold-outs by implementers, and the slow burning yet visible tension between FRAND commitments and compulsory licensing continue to cloud the future of SEP licensing and enforcement. This paper explores critical questions surrounding the evolving SEP landscape in developing countries. It investigates whether domestic regulation of FRAND terms is sufficient to guarantee affordable SEP access in these nations. The analysis also addresses the implications of blanket or over-disclosure of patents for local industries and innovation ecosystems. Crucially, the paper examines whether tools like patent pooling and compulsory licensing can be re-evaluated within the rapidly changing IoT ecosystem to facilitate equitable SEP access in developing countries, without stifling innovation incentives for SEP holders. Furthermore, it assesses whether FRAND royalty rates should be determined by market forces or regulatory oversight. The paper concludes by examining how India, China, and South Africa are addressing global SEP challenges, aiming to derive insights for a more balanced and implementer-friendly licensing framework. Through a doctrinal analysis of legal texts, policy instruments, and judicial developments, this paper endeavours to outline a more equitable and transparent SEP licensing environment, ultimately seeking to make SEPs more “FRANDly” in both principle and practice for developing countries navigating global technological convergence.

KEYWORDS: SEP, IoT, FRAND, Developing Countries, BAAD Rates

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INTRODUCTION

Standard-Essential Patents (SEPs) represent a critical component of the modern technological landscape, protecting inventions deemed indispensable for the implementation of technical standards.⁴⁸⁰ These standards, encompassing a vast array of technologies such as 5G, Wi-Fi, MPEG, JPEG, and CD/DVD, are fundamental to ensuring interoperability and seamless communication across diverse devices and networks.⁴⁸¹ The pervasive nature of these standards means that any product or service adhering to them must necessarily utilize the underlying patented technology.⁴⁸² A patent covering technologies which are necessary to comply with the standards is called standard-essential patent (SEP)⁴⁸³. According to some studies, there are over 45,000 and 39,000 patents declared essential to 4G LTE and 3G UMTS respectively,⁴⁸⁴ and as many as 95,000 patent declarations for 5G.⁴⁸⁵

The rapid rise of the Internet of Things (IoT) has significantly elevated the importance of SEPs. As IoT shifts from concept to reality, ensuring interoperability among countless connected devices is of paramount significance—making SEPs central to global technological integration. SEPs not only facilitate this interoperability but also incentivize R&D, which enable the innovators to regain and justify investments through licensing once their technologies are adopted as standards. To prevent misuse of market power, SEP holders commit to licensing on Fair, Reasonable, and Non-Discriminatory (FRAND) terms. This ensures a fair return for patent owners while providing implementers with equitable access, ultimately supporting competition and innovation in standard-dependent industries.

PERSISTENT CHALLENGES IN SEP LICENSING AND ENFORCEMENT, PARTICULARLY FOR DEVELOPING COUNTRIES

Despite the theoretical benefits and the foundational role of SEPs and FRAND commitments, the global SEP landscape is currently fraught with persistent and unresolved issues. These challenges can be described as the "elephant in the room," casting significant uncertainty over the future of SEP licensing and enforcement. The pertinent issues involve the monopolistic tendencies observed among some SEP holders, the inherent ambiguity surrounding the interpretation and application of FRAND licensing terms, and strategic "hold-outs" employed by implementers seeking to delay or avoid licensing obligations. Furthermore, a growing tension

⁴⁸⁰ World Intellectual Property Organization, Standard Essential Patents.

⁴⁸¹ European Commission, Question and Answers on Standard Essential Patents, (Issued on April 27, 2023).

⁴⁸² Think Tank European Parliament, Standard Essential Patents Regulation (Issued on November, 9, 2023).

⁴⁸³ Lemley M A & Shapiro C, A Simple Approach to Setting Reasonable Royalties for Standard-Essential Patents, 28 BTLJ 1135, (2013).

⁴⁸⁴ J Baron and T Pohlmann, Mapping Standards to Patents Using Databases of Declared Standard-Essential Patents and Systems of Technological Classification, 27 JEMS, 504, 521 (2018); TCL v Ericsson, 2017 CD Cal, 27–28.

⁴⁸⁵ T Pohlmann and K Blind, Fact Finding Study on Patents Declared to the 5G Standards, (Jan 2020), <https://dl.icdst.org/pdfs/files3/6be84b607e920b07ed3708ea6e262255.pdf>.



exists between the voluntary FRAND commitments made by SEP holders and the potential invocation of compulsory licensing mechanisms by governments, often for public interest reasons.

Developing countries, in particular, face unique and often exacerbated challenges within this complex environment. As net importers of technology and intellectual property, they are disproportionately vulnerable to inequitable licensing terms and practices.⁴⁸⁶ Such practices can severely hinder their industrial development, stifle local innovation, and impede their access to essential technologies critical for economic growth and societal well-being.⁴⁸⁷ The fundamental policy dilemma lies in balancing the pro-innovation aspects of SEPs with their potential for anti-competitive behavior. This inherent tension means that the challenge is not to eliminate SEPs, but to design regulatory and contractual frameworks that effectively harness their benefits while rigorously mitigating their risks. For developing countries, this balance is paramount, as their capacity to absorb and utilize global standards depends heavily on predictable and affordable access, directly impacting their economic development.

The contradiction between the territorial nature of patents and the inherently global nature of technology, especially in the age of IoT, further complicates this landscape. This fundamental mismatch contributes to a fragmented and often inconsistent global legal environment, leading to what are frequently termed "FRAND wars".⁴⁸⁸ Patent holders, in their pursuit of enforcing territorial rights within a global market, often engage in multi-jurisdictional litigation. This forces implementers, particularly those in developing countries, to navigate a complex web of national laws and judicial precedents, significantly increasing transaction costs and legal uncertainty. The absence of a harmonized international framework for SEP licensing means that developing countries are frequently drawn into costly legal battles, diverting precious resources from innovation and market development.

This paper examines a set of interrelated questions that lie at the heart of the evolving SEP framework in developing countries. It explores whether domestic regulation of FRAND terms alone can secure affordable access, and assesses the implications of blanket or excessive patent disclosure for local industries and innovation ecosystems. It further considers how mechanisms such as patent pooling and compulsory licensing might be recalibrated in the fast-changing IoT environment to promote equitable access without eroding innovation incentives for SEP holders. The discussion also addresses whether FRAND royalty rates should be shaped primarily by market dynamics or through regulatory oversight, and analyses the approaches of India, China,

⁴⁸⁶ World Intellectual Property Organization, *The Impact of the International Patent System on Developing Countries: A Study* by NG Siew Kuan, Elizabeth, A/39/13 ADD.3 (Issued on August 15, 2003).

⁴⁸⁷ *Id.*

⁴⁸⁸ Wentong Zheng, *Jurisdictional Competition on Standard Essential Patents*, 14 JIEPL, (2025).



and South Africa to global SEP challenges, drawing lessons for a more balanced and implementer-friendly licensing regime.

THE TRIPS AGREEMENT: PROMISES, DISAPPOINTMENTS, AND THE "KICKING AWAY THE LADDER" OF DEVELOPMENT

In the post–World War II era, newly independent developing countries began questioning whether international IP standards—like those in the Paris and Berne Conventions favored knowledge appropriation over its broader diffusion. Their push for reforms, including measures like compulsory licensing, faced strong resistance, especially from powerful nations like the U.S., and ultimately failed. This culminated in the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), which further entrenched stringent IP protections. Critically, TRIPS has been accused of “kicking away the ladder” by denying developing countries the same path to growth through imitation and learning that once benefited today’s developed nations.

The historical trajectory of intellectual property (IP) protection reveals a pattern wherein IP standards were initially imposed through colonial structures, a dynamic that persists in the post-colonial era through instruments like the TRIPS Agreement. Developed countries have strategically leveraged multilateral forums and assertive trade policies to enforce stringent IP regimes, illustrating that the current global landscape for SEP is not merely market-driven but is profoundly shaped by historical and geopolitical power asymmetries. This historical legacy continues to influence SEP licensing, where developing countries—often former colonies and net technology importers—grapple with licensing regimes tailored to the interests of technology-exporting nations. Compounding this challenge is the structural shift in the global economy from agriculture and manufacturing to a knowledge-based paradigm, wherein intangible assets and IP hold disproportionate value. In this new framework, strong IP protections under agreements like TRIPS, though designed to incentivize innovation, can lead to significant “rent transfers” from developing to developed countries in the form of licensing fees and royalties. These transfers may result in substantial short-term financial losses and further entrench existing inequalities. Therefore, relying solely on market-based mechanisms for determining fair, reasonable, and non-discriminatory (FRAND) terms risks perpetuating systemic imbalances unless accompanied by deliberate regulatory frameworks and enhanced international cooperation. It is thus essential for developing nations to proactively engage in shaping SEP licensing norms to safeguard their developmental and economic interests.⁴⁸⁹

CORE CHALLENGES IN SEP LICENSING FOR DEVELOPING COUNTRIES

Monopolistic Behavior of SEP Holders

⁴⁸⁹ *Supra* note 7.



SEPs inherently confer significant market power upon their holders due to their foundational nature within industry standards.⁴⁹⁰ Any company seeking to produce a standard-compliant product must access these patented technologies, making SEPs exceptionally valuable and their holders key gatekeepers of technological adoption.⁴⁹¹ This substantial leverage, however, necessitates careful management to prevent violations of antitrust regulations.⁴⁹² The potential for misuse, commonly termed "patent holdup," arises when SEP holders exploit their essential position to demand excessive royalties, restrict competition, inflate prices for consumers, or outright deny licenses, thereby imposing restrictive and unfair terms.⁴⁹³ This behavior can be seen as extracting value beyond the intrinsic contribution of the patented technology, leveraging the "lock-in" effect of the standard.⁴⁹⁴

The concept of Patent Hold-up is based on this potential *ex post* opportunism of SEP holders determining royalties once their technology becomes a part of the standard.⁴⁹⁵ There are examples where courts found that the initial royalty demands by SEP holders were more than a FRAND rate, which are taken as instances of opportunistic holdup practices. In *Microsoft v Motorola*, Motorola initially demanded a royalty of 2.25 per cent of the end price of Microsoft's products for SEPs covering 802.11 (Wi-Fi) and H.264 audio-video encoding standards.⁴⁹⁶ The court, assessing the importance of Motorola's patents to 802.11 and H.264 standard and the importance of these standards and SEPs to Microsoft's product, determined a FRAND royalty rate of 3.471 cents and 0.555 cents per unit for the 802.11 and H.264 SEP portfolios respectively.⁴⁹⁷

This concentration of power in the hands of SEP holders presents a significant challenge, especially for developing countries that often lack the legal and economic leverage to negotiate fair terms. When FRAND commitments are not honored in spirit—through inflated royalty demands or discriminatory licensing—it disproportionately affects these nations by limiting affordable access to essential technologies.

Strategic Hold-Outs by Implementers

While patent holdup and royalty stacking refer to the behavior of SEP owners, patent hold-out is concerned opportunistic conduct of standard implementers. Holdout is a situation where standard implementers avoid paying royalties as much as possible in order to pressure SEP holders to settle for sub-optimal rates or evade

⁴⁹⁰ Bao Tran, Understanding the Relationship Between Standard- Essential Patents and Antitrust Law, (Jul.26, 2025), <https://patentpc.com/blog/understanding-the-relationship-between-standard-essential-patents-and-antitrust-law>

⁴⁹¹ *Id.*

⁴⁹² *Supra* note 11.

⁴⁹³ *Supra* note 2.

⁴⁹⁴ J. Gregory Sidak, The Meaning of FRAND Part II: INJUNCTIONS, 2 J. Compet. Law Econ., 201 (2015).

⁴⁹⁵ Igor Nikolic, *Licensing Standard Essential Patents: FRAND and the Internet of Things* 68 (Hart Publishing 2021).

⁴⁹⁶ *Microsoft Corp. v Motorola Inc.* (2013) JLR 1823.

⁴⁹⁷ *Id.*



paying any royalties altogether.⁴⁹⁸ The negative effects of systematic holdout are that patent holders remain undercompensated for the use of their technologies, which diminishes incentives to innovate and invest in the development of new standardized technologies.⁴⁹⁹

Real examples of holdout can be found in the literature and case law. Bowman and Petit document different types of delaying tactics used by manufacturers to avoid taking a license.⁵⁰⁰ For example, manufacturers may offer negotiation terms that are not in line with industry practice, such as insisting on patent-by-patent and country-by-country licensing, endlessly postponing negotiation meetings or sending envoys with no authority to conclude licensing agreements.⁵⁰¹ In *Unwired Planet v Huawei*, the SEP owner was on the verge of insolvency because it could not conclude licenses for its 3G and 4G SEP portfolio and had to engage in expensive and protracted worldwide litigation.⁵⁰² The SEP owner was ultimately acquired by another company that was able to fund the ongoing litigation.⁵⁰³

Blanket Or Over-Disclosure of Patents and Its Ramifications

"Over-declaration" refers to the widespread practice where patents are declared as essential to a standard even when they are not truly essential to its implementation.⁵⁰⁴ This practice is pervasive and leads to significantly inflated patent counts, rendering them unreliable measures of true essentiality.⁵⁰⁵ Back in 2004, Goodman and Mayers examined 7,796 patents and patent applications declared as essential for the 3G standard and found that only approximately 21 per cent of the declared patents were truly essential. In other words, 79 per cent of declared SEPs were non-essential.⁵⁰⁶ The reason behind these large numbers of non-essential patents declared to be a SEP is the over-disclosure of patents. This phenomenon is partly a consequence of Standard-Setting Organization (SSO) intellectual property policies, which may encourage broad declarations without rigorous upfront essentiality checks.

Ambiguity of FRAND (Fair, Reasonable and Non-Discriminatory) Licensing Terms

A pervasive and fundamental challenge in SEP licensing stems from the inherent ambiguity of FRAND (Fair, Reasonable, and Non-Discriminatory) terms. The lack of clear, universally agreed-upon definitions for what constitutes "fair," "reasonable," and "non-discriminatory" terms leads to frequent disputes and significant

⁴⁹⁸ Supra note 16 at 80.

⁴⁹⁹ *Id.*

⁵⁰⁰ Supra note 19 at 81

⁵⁰¹ *Id.*

⁵⁰² *Unwired Planet International Ltd. v. Huawei Technologies Co. Ltd. and Ors*, (2017) EWHC 711 (Pat)

⁵⁰³ *Id.*

⁵⁰⁴ Supra note 2.

⁵⁰⁵ GOV. UK, Consultations on Standard Essential Patents (SEPs), (Issued on July 15, 2025).

⁵⁰⁶ D.J. Goodman & R.A. Myers, 3G Cellular Standards and Patents, (June, 2005), <https://ieeexplore.ieee.org/document/1549445>



difficulty for implementers, particularly in developing countries, to predict and manage licensing costs effectively. This vagueness creates an environment ripe for conflict, as each party interprets FRAND in a manner most favorable to its own interests.⁵⁰⁷ Standard-Setting Organizations (SSOs), while typically mandating FRAND commitments from SEP holders, deliberately refrain from specifying the precise methodologies for determining FRAND royalty rates.⁵⁰⁸ This intentional omission leaves this crucial aspect open to interpretation, negotiation, and often, contentious litigation.⁵⁰⁹

The global divergence in SEP enforcement particularly around the granting of injunctions—stems largely from the inherently ambiguous nature of FRAND commitments. Without a universally accepted definition of what constitutes "fair," "reasonable," or "non-discriminatory," national courts have adopted markedly different approaches, giving rise to the so-called "FRAND wars." While jurisdictions like Germany and the UK are more open to granting injunctions under structured conditions, the U.S. and China have taken more restrictive or even hostile stances.⁵¹⁰ This inconsistency enables strategic forum shopping and fuels transnational litigation, as both SEP holders and implementers seek favourable legal ground. The lack of clarity surrounding FRAND not only complicates enforcement but also risks undermining its core purpose: balancing access to essential technologies with protection against both patent hold-up and implementer holdout.

Governance of Frand Royalty Rates: Market Forces VS. Regulatory Oversight

The determination of FRAND royalty rates remains a key tension in SEP licensing, with debates centered on whether rates should be guided by market forces or regulatory oversight. Market-driven approaches are favored for their flexibility, efficiency, and ability to reflect the economic value of SEPs through negotiation and comparable licensing.⁵¹¹ Proponents argue this model incentivizes R&D and avoids regulatory distortions.⁵¹² Courts, especially in the U.S., have played a critical role in shaping these outcomes without imposing rigid frameworks.⁵¹³ However, unregulated markets can risk patent holdup, pricing opacity, and discrimination—issues particularly burdensome for SMEs and implementers in developing countries.⁵¹⁴

⁵⁰⁷ Andras Jokuti, A FRAND in need: why establishing standardized technologies is so complicated, (Dec. 9, 2024) <https://www.wipo.int/web/wipo-magazine/articles/a-frand-in-need-why-establishing-standardized-technologies-is-so-complicated-69933>.

⁵⁰⁸ *Supra* note 9.

⁵⁰⁹ *Id.*

⁵¹⁰ *Supra* note 29.

⁵¹¹ Anne Layne-Farrar et al., Pricing Patents for Licensing in Standards Development Organizations: Making Sense of FRAND Commitments, 74 Antitrust L.J., 671, (2007).

⁵¹² Damien Geradin, Ten Years of Competition Law Enforcement in High-Tech Markets: Where Do We Stand?, 9 J. Competition L. & Econ., 651, (2013).

⁵¹³ Microsoft Corp. v. Motorola, Inc., 795 F.3d 1024 (9th Cir. 2015).

⁵¹⁴ Jorge L. Contreras, Much Ado About Hold-Up, U. Ill. L. Rev., 875, (2019).



On the other hand, regulatory intervention can promote transparency, address power imbalances, and prevent abusive practices by SEP holders. The EU's proposal for an administrative FRAND determination mechanism exemplifies this approach.⁵¹⁵ However, excessive regulation may disincentivize SEP contributions to standards, especially if royalties are artificially suppressed.⁵¹⁶ The balance between innovation and access is further complicated by varied interpretations of “non-discriminatory” treatment, enforcement challenges, and fragmented global practices.⁵¹⁷ Nonetheless, keeping in picture the sensitivity of intellectual property rights and innovation incentives, a well-calibrated domestic regulatory frameworks aligned with international competition norms currently offer the most pragmatic and equitable route to making FRAND terms truly accessible, especially in the context of global technology diffusion and IoT implementation.

THE IoT ECOSYSTEM: EXPANDING HORIZONS AND INTENSIFYING IP CHALLENGES

The Global Nature of Iot and Its Reliance on SEPs

The Internet of Things (IoT) has rapidly transformed from a futuristic concept into a pervasive reality, fundamentally reshaping global technological convergence. This ecosystem encompasses a wide and growing spectrum of connected devices, ranging from sophisticated applications like connected cars and drones to everyday items such as payment terminals, smart meters, health monitors, and various other smart devices.⁵¹⁸

Already, an estimated 19.8 billion devices are connected to the internet, with projections suggesting this number will rise to over 40 billion by 2030.⁵¹⁹ The economic impact of the Internet of Things (IoT) is similarly substantial recent studies by McKinsey estimate that IoT technologies could generate between \$5.5 trillion and \$12.6 trillion annually by 2030, depending on adoption rates and policy environments.⁵²⁰ A significant portion of this growth will be facilitated by the widespread deployment of 5G cellular communication standards, which enable high-speed, low-latency, and reliable connectivity across a massive number of devices.⁵²¹ The

⁵¹⁵ COM(2023)232 - Proposal for a regulation of the European Parliament and of the Council on standard essential patents and amending Regulation (EU) 2017/1001, 2023.

⁵¹⁶ Justus Baron & Tim Pohlmann, Mapping Standards to Patents Using Declarations of Standard-Essential Patents, 27 J. Econ. & Mgmt. Strategy, 504, (2018).

⁵¹⁷ Huawei Techs. Co. v. ZTE Corp., Case C-170/13, EU:C:2015:477 (CJEU).

⁵¹⁸ *Supra* note 3.

⁵¹⁹ Finances Online, Number of Internet of Things (IoT) Connected Devices Worldwide 2024: Breakdowns, Growth & Predictions, (July 17, 2025), <https://financesonline.com/number-of-internet-of-things-connected-devices/#:~:text=The%20number%20of%20connected%20Internet%20of%20Things%20%28IoT%29,an%20estimated%20value%20of%20more%20than%20%241%20trillion.>

⁵²⁰ James Manyika et al., Unlocking the Potential of the Internet of Things, McKinsey Global Inst., (June 1, 2015), <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/the-internet-of-things-the-value-of-digitizing-the-physical-world>

⁵²¹ GSMA Intelligence, Internet of Things in the 5G ERA: Opportunities and Benefits for Enterprises & Consumers, (2019) <https://www.scribd.com/document/469989965/201911-GSMA-IoT-Report-IoT-in-the-5G-Era-pdf>.



interoperability enabled by such standardized communication protocols is estimated to account for nearly 40% of the total potential economic value of IoT applications, underscoring the critical role of technical standards in unlocking the full benefits of connectivity.⁵²²

Challenges In SEP Licensing in the Iot Ecosystem

The rapid proliferation of the IoT has significantly complicated the landscape of SEP licensing. Unlike earlier telecommunications models, IoT devices span a multitude of verticals—such as automotive, healthcare, and smart home technologies each with its own set of technical standards, business practices, and innovation cycles.⁵²³ This expansion has resulted in a steep rise in the number of SEPs involved, increasing the cost and complexity of licensing negotiations. A persistent lack of transparency in SEP declaration and essentiality assessments creates legal uncertainty, complicating risk management for implementers.⁵²⁴ Compounding this, novel IoT-driven business models such as recurring subscriptions or data monetization do not align cleanly with legacy royalty frameworks, raising questions about valuation and appropriate licensing level (e.g., chip vs. module vs. final product).⁵²⁵

In developing countries, these challenges assume greater severity. Implementers often lack institutional experience with FRAND negotiations and are more vulnerable to practices such as patent holdup or royalty stacking.⁵²⁶ Patent value varies considerably across use cases: for instance, the contribution of a 5G SEP is significantly more consequential in connected vehicles than in simple sensors, complicating equitable pricing.⁵²⁷ Both holdup (excessive SEP royalties) and hold-out (license avoidance) remain unresolved, especially in cross-industry contexts.⁵²⁸

Concurrently, global power dynamics are shifting: Chinese entities now own approximately one-third of all declared SEPs, reshaping bargaining landscapes and policy authority.⁵²⁹ Emerging regulatory efforts, such as

⁵²² *Id.*

⁵²³ Jorge L. Contreras, *The Global Standards Wars: Patent and Competition Disputes in North America, Europe, and Asia*, Keio University Journal of Law, Politics and Sociology, (2018).

⁵²⁴ Barbara Lauriat, *Pay No Attention to the Comparable: Transparency Gaps in SEP Markets*, 38 Berkeley Tech. L.J. 463, 468–72 (2023).

⁵²⁵ Christopher S. Storm, *Standard Essential Patents Versus the World: How the Internet of Things Will Change Patent Licensing Forever*, 30 Tex. Intell. Prop. L.J., 259, (2021).

⁵²⁶ *Supra* note 9.

⁵²⁷ *Id.*

⁵²⁸ *Supra* note 4.

⁵²⁹ *Supra* note 9.



the European Union's proposed SEP database and mandatory arbitration, as well as considerations of patent pooling and compulsory licensing, underscore the fragility of the status quo.⁵³⁰

EXISTING APPROACHES TO SEPS AND FRAND: GAINS AND GAPS

Reliance On Domestic Regulation of Frand Terms

Effectiveness And Limitations of National-Level Regulatory Approaches

The question of whether developing countries must rely solely on domestic regulation of FRAND terms to ensure affordable access to SEPs is a central point of contention. National-level regulatory approaches offer the potential for tailoring policies to specific domestic needs and economic conditions. Though domestic regulations can be effective, studies warn that narrow industrial policies may heighten financial fragility and that fragmented policymaking even when aligned with Sustainable Development Goals (SDGs) can lead to unintended consequences, underscoring the need for coherent and balanced frameworks.⁵³¹ However, though the territorial nature of patents clashes with the cross-border nature of technology markets, giving rise to complex transnational disputes often termed “FRAND wars” where different jurisdictions adopt conflicting interpretations of FRAND obligations and remedies, despite these challenges, domestic regulation remains a necessary instrument, particularly in light of the flexibilities provided under international law. Article 40 of the TRIPS Agreement⁵³² explicitly recognizes that certain licensing practices related to intellectual property rights may have adverse effects on competition and permits member states to enact appropriate measures to prevent or control such anti-competitive practices. This provision empowers countries to intervene when SEP licensing hinders fair competition or exploits domestic implementers. Though imperfect, domestic regulation anchored in TRIPS-compliant competition safeguards currently stands as the most pragmatic solution for developing countries and, as discussed later in this paper, offers a viable path toward making FRAND terms truly “FRANDly.”

RECALIBRATION OF PATENT POOLING AND COMPULSORY LICENSING FOR EQUITABLE ACCESS TO SEPS IN DEVELOPING COUNTRIES

Patent Pooling: Benefits And Challenges in the Iot Context

⁵³⁰ Nick Huber, EU faces telecoms ire over new Standard Essential Patent rules, Fin. Times (June 2024); Ruud Peters et al, Designing Standard Essential Patents Licensing Negotiation Groups to Reduce Patent Holdout in IoT Markets, 5G and Beyond, Cambridge Univ. Press, 155, (2023).

⁵³¹ Jan Anton van Zanten and Maria Putintseva, Study Highlights Gaps in Governmental Policies for Achieving SDGs, (Feb 5, 2025), <https://sdg.iisd.org/commentary/guest-articles/study-highlights-gaps-in-governmental-policies-for-achieving-sdgs/#:~:text=A%20new%20study%20suggests%20that%20half%20the%20world%E2%80%99s,coherence%20and%20effectiveness%20as%20the%202030%20deadline%20looms.>

⁵³² The TRIPS Agreement, art. 2.



Patent pools where multiple SEP holders collectively license their patents through a single platform—offer a pragmatic solution to the challenges of SEP licensing in the fragmented IoT ecosystem. By serving as a “one-stop shop,” they reduce transaction costs, litigation risks, and licensing complexity, offering implementers, especially SMEs, greater freedom to operate.⁵³³ Well-managed pools also promote transparency through third-party essentiality checks and clear royalty terms, fostering innovation and competition by lowering entry barriers.⁵³⁴ These benefits are particularly valuable in the IoT sector, where interoperability depends on access to numerous SEPs spread across different owners and industries.

However, patent pools are not without challenges. They may lack full SEP coverage for a given standard, requiring implementers to engage in additional bilateral negotiations. Determining fair aggregate royalties across varied IoT applications remains difficult, as does ensuring the participation of SEP holders with significant portfolios. Moreover, pools must be carefully structured to avoid antitrust violations.⁵³⁵ Despite their limitations, patent pools remain a useful tool for developing countries to ease SEP access, reduce enforcement risks, and support inclusion in the digital economy. However, they are not the most effective means of ensuring truly accessible FRAND terms. As discussed later in the paper, a more robust and equitable solution lies in strengthening domestic regulatory frameworks aligned with international norms and competition safeguards.

Compulsory Licensing: Effectiveness, Limitations, And Potential For Recalibration:

Compulsory licensing, permitted under Article 31 of the TRIPS Agreement, allows governments to authorize the use of patented inventions without the patent holder’s consent, prioritizing public interest.⁵³⁶ It has proven effective in public health crises such as improving access to HIV/AIDS treatments and in ensuring affordability of essential goods. However, its impact is limited by TRIPS’s “domestic market” clause, complex procedures, fears of trade retaliation, and concerns over weakening innovation incentives.⁵³⁷ While valuable, especially for emergencies, compulsory licensing is not a comprehensive solution for SEP access in the IoT context. Strengthened domestic regulation remains a more practical and scalable approach to making FRAND terms truly accessible.⁵³⁸

⁵³³ Number Analytics, The Future of Standard Essential Patents, (June 23, 2025), <https://www.numberanalytics.com/blog/future-standard-essential-patents>.

⁵³⁴ Gustav Brismark et al, Overview Of SEPs, FRAND Licensing And Patent Pools, (August, 2023), <https://lesi.org/article-of-the-month/overview-of-seps-frand-licensing-and-patent-pools/>.

⁵³⁵ Hyun Jin In et al, How Standardization, SEPs, and Patent Pools Can Benefit the EV and Battery Industries - Fish & Richardson, https://www.fr.com/uploads/4465-resource_standardization-seps-patent-pools.pdf.

⁵³⁶ Jerome H. Reichman, Compulsory Licensing of Patented Pharmaceutical Inventions: Evaluating the Options, *Pharmaceutical Regulations*, 247, (2009).

⁵³⁷ *Id.*

⁵³⁸ Hillary Wong, The Case for Compulsory Licensing during COVID-19 - PMC, *J.Glob. Health*, (2020).



At the same time, if not carefully regulated, compulsory licensing can tilt the balance too far in favor of implementers. While it may provide much-needed relief from excessive royalties or licensing deadlocks, indiscriminate or opportunistic use of this tool could undermine the value of patents and discourage investment in innovation.⁵³⁹ SEP holders may be less willing to contribute cutting-edge technologies to standard-setting processes if they fear that their rights could be easily overridden. This could ultimately curb the incentive for novelty and invention, weakening the overall innovation ecosystem. Therefore, while compulsory licensing can serve as a corrective tool, it must be applied judiciously to avoid abuse and ensure a fair balance between access and innovation.

RESPONSES OF INDIA, CHINA, AND SOUTH AFRICA TO GLOBAL SEP CHALLENGES

India

India approaches SEP regulation primarily through its competition law framework, as TRIPS lacks specific SEP provisions. The judiciary plays a central role, balancing innovation incentives with public access to technology. Indian courts consistently emphasize “good faith” negotiations in FRAND licensing, drawing from both domestic concerns and global jurisprudence.⁵⁴⁰ This pragmatic yet assertive stance reflects a growing judicial sovereignty in SEP matters, particularly as Indian courts refuse to be bound by foreign anti-suit injunctions and promote equitable licensing environments for implementers and patent holders alike.

In *Koninklijke Philips v. Suresh Behl*⁵⁴¹, the court upheld a DVD-related SEP and imposed aggravated damages for willful infringement, affirming FRAND rates as the basis for damages. *Ericsson v. Xiaomi* followed with an ex parte injunction, emphasized the consequences of ignoring Indian patent law and failing to negotiate in good faith.

A significant milestone came with *InterDigital v. Xiaomi* (2021)⁵⁴², where the Delhi High Court issued India’s first anti-enforcement injunction against a Chinese anti-suit order. The court asserted that foreign proceedings cannot override Indian jurisdiction in SEP disputes and emphasized transparency and fairness in cross-border litigation. Most recently, in *Ericsson v. Lava* (2024)⁵⁴³, the court awarded substantial damages and endorsed the “Comparable Licensing” approach over the “Top-Down” model due to insufficient data from the implementer. It also recognized that SEP holders can claim damages for past use when negotiations are not conducted in

⁵³⁹ *Id.*

⁵⁴⁰ Rahul Jain & Rushika Bakshi, Comprehensive Analysis of SEP Litigation: Understanding Anti-Suit Injunctions And Frand Licensing in India & USA, (June 29, 2025), COMPREHENSIVE ANALYSIS OF SEP LITIGATION: UNDERSTANDING ANTI-SUIT INJUNCTIONS AND FRAND LICENSING IN INDIA & USA – Legal Developments

⁵⁴¹ *Id.*

⁵⁴² Maheshwari & Co., How Recent Indian Patent Decisions on Standard Essential Patents (SEPs) Can Make of Break Your Business, (Jan 6, 2025), <https://www.maheshwariandco.com/blog/standard-essential-patents/>.

⁵⁴³ *Supra* note 61.



good faith. Together, these rulings underscore India's growing legal sophistication and autonomy in SEP enforcement. However, the Indian courts focus on specific case-by-case determinations rather than broad policy which adds an element of uncertainty in the legal landscape of SEPs and FRAND terms.

China

China's SEP and FRAND framework is shaped by an active government role in standard-setting and a civil law judicial system rooted in the principle of good faith. The courts have emerged as pivotal actors in advancing a domestic strategy that balances national industrial policy with the enforcement of fair and reasonable licensing norms.⁵⁴⁴ The landmark *Huawei v. IDC*⁵⁴⁵ case was China's first to adjudicate FRAND royalty rates and set important procedural and substantive standards, though its reasoning left ambiguities regarding the alignment of judicial rulings with state policy goals. More recently, in *Advanced Codec Technologies v. OPPO (2024)*, the Supreme People's Court (SPC) clarified China's preferred method for determining FRAND royalty rates by adopting the Comparable Agreement Method.⁵⁴⁶ This case introduced a robust four-pronged test to evaluate comparability, emphasizing the context of amicable, litigation-free negotiations as a key factor. Agreements reached under coercive conditions were disfavoured, reinforcing the court's commitment to fair market-based outcomes. Additionally, the SPC considered the similarity of licensees, the nature and quality of licensed patents, and the licensing terms, thereby formalizing a comprehensive and transparent assessment framework.⁵⁴⁷ China's courts thus prioritize predictability, discourage litigation-driven royalty inflation, and aim to foster a cooperative licensing environment. By rejecting agreements reached under legal duress as valid comparables, Chinese courts set a normative benchmark that could both pressure SEP holders to negotiate sincerely and empower implementers with clearer defenses against opportunistic demands.

South Africa

South Africa's SEP landscape is governed primarily through its patent and competition law frameworks, with no explicit statutory FRAND regime. The Competition Act, 1998 empowers the Competition Commission to investigate abuse of dominance, while the 2018 Intellectual Property Policy (Phase I) encourages using TRIPS flexibilities—such as compulsory licensing and parallel imports to support public health, local manufacturing, and innovation.⁵⁴⁸ The policy also advocates integrating IP and competition law to align with socio-economic

⁵⁴⁴ Xiao Jin, China trends for SEP licence fees, comparable court methods, (Sept. 26, 2024), <https://law.asia/china-sep-license-fees-court-methods/>.

⁵⁴⁵ Jyh-An-Lee, Implementing the FRAND Standard in China, 19 JETLAW, 37 (Issue 1. 2020).

⁵⁴⁶ *Id.*

⁵⁴⁷ *Supra* note 67.

⁵⁴⁸ Matthias Bornhauser, The Relation between Intellectual Property Law and Competition Law using the example of Standard Essential Patents, UCT, (2014).



goals, though judicial elaboration remains limited.⁵⁴⁹ South African courts recognize "reasonable royalty" as a remedy for patent infringement, but case law on SEP-specific abuse or FRAND rate-setting is sparse. In *Pfizer v. Cipla* (2005), the court acknowledged the option of a reasonable royalty but noted the lack of precedents and the difficulty in proving such damages.⁵⁵⁰ This theme continued in *Resca v. Dave Sheer Gunsmithing* (2011), *Hans Sasserath v. Advanced Valves* (2022), and *Villa Crop v. Bayer* (2022), where courts accepted the remedy but offered no concrete methodology for determining royalties.⁵⁵¹ Patent infringement cases are heard by the Court of the Commissioner of Patents, which applies a purposive approach to interpreting claims and allows the Gillette defence.⁵⁵² However, South African jurisprudence lacks detailed guidance on FRAND terms, SEP abuse, or royalty calculation standards. The courts have so far refrained from developing a dedicated FRAND framework, favoring general patent and competition law tools.

COMPARATIVE INSIGHTS AND THE EVOLVING TRAJECTORY OF SEP GOVERNANCE IN DEVELOPING ECONOMIES

India, China, and South Africa offer distinct yet instructive trajectories in shaping SEP and FRAND regimes within developing economies. Despite contextual differences, they converge on the recognition of SEPs' critical role in technological development and the need for FRAND commitments to balance innovation incentives with public access.⁵⁵³

- a. **Judicial Interpretation and Royalty Methodologies:** India and China have demonstrated rapid legal maturity, with Indian courts actively asserting judicial sovereignty—especially via anti-enforcement injunctions—and favoring the comparable licensing method, albeit often using the full device price as a royalty base. China's approach is more structured, with its Supreme People's Court prioritizing amicable comparable agreements and offering granular royalty assessment frameworks, aligning with broader industrial policy objectives.⁵⁵⁴ South Africa, in contrast, lacks developed SEP-specific jurisprudence, relying largely on general patent and competition principles with limited clarity on FRAND rate determination.
- b. **Role of Competition Law and Jurisdictional Strategies:** All three countries invoke competition law to check SEP-related market abuse. Notably, both India and China engage in jurisdictional

⁵⁴⁹ Department: Trade, Industry and Competition REPUBLIC OF SOUTH AFRICA, Intellectual Property (IP) Policy.

⁵⁵⁰ ICLG, Patents Laws and Regulations Report, (October 9, 2024), <https://iclg.com/practice-areas/patents-laws-and-regulations/south-africa>.

⁵⁵¹ *Villa Crop Protection (PTY) LTD. v. Bayer Intellectual Property GmbH*, CC 237/201.

⁵⁵² ENSight, Patent infringement: the pith and the marrow, <https://www.ensafrica.com/news/detail/6484/patent-infringement-the-pith-and-the-marrow>

⁵⁵³ *Supra* note 61.

⁵⁵⁴ *Supra* note 1.



assertion through ASIs, reflecting an emerging competition for forum control over global SEP disputes.⁵⁵⁵ South Africa's jurisprudence is less assertive, reflecting its earlier stage of SEP policy development.

- c. **Legislative and Policy Evolution:** China exemplifies a coordinated state-led SEP strategy; India balances global standards with domestic judicial independence; South Africa's IP policy emphasizes public interest and TRIPS flexibilities, though it remains in early stages of SEP implementation.

Yet, despite visible strides, the governance of SEPs in developing economies remains fragmented, inconsistent, and largely reactive. India grapples with judicial unpredictability and the absence of statutory guidance. China, while more proactive, often relies on regulatory discretion that may raise concerns about due process. South Africa suffers from an acute lack of jurisprudence, creating legal uncertainty and undermining both innovators' incentives and implementers' rights. Across all three jurisdictions, there is still no robust framework for transparent, predictable FRAND royalty-setting—leaving implementers vulnerable to opportunistic litigation, and patent holders uncertain about enforcement outcomes.

In sum, SEPs are still not truly FRANDly for developing countries. Instead, these jurisdictions remain in the early stages of constructing coherent legal and institutional responses. Without comprehensive reforms, this gap risks deepening the global imbalance in innovation access and IP enforcement. As such, a principled, development-oriented approach to SEP governance is urgently needed—one that goes beyond reactive litigation to proactively embed fairness, affordability, and legal certainty into the very architecture of IP law.

BAAD AS A BENCHMARK FOR FAIR SEP–FRAND LICENSING

The FRAND framework remains inherently vague, as SSOs rarely define what "fair, reasonable, and non-discriminatory" actually means making it an incomplete contract. This ambiguity, combined with inconsistent interpretations across jurisdictions, fuels global disputes and strategic misuse by both SEP holders and implementers, underlining the urgent need for a clearer, harmonized standard.

In light of the enduring ambiguity around what constitutes FRAND terms, this paper proposes a more enforceable alternative: the "BAAD" framework, which defines what FRAND is *not*. Standing for Biased, Arbitrary, Anti-competitive, and Discriminatory, BAAD serves as a diagnostic lens to identify BAAD rates licensing terms that clearly fall outside the scope of fairness, reasonableness, and non-discrimination. The BAAD Framework responds to this gap through a structured, exclusion-based approach:

- **Biased:** Refers to one-sided licensing practices that exploit information asymmetry or negotiation imbalances, particularly harming smaller players and implementers in developing countries.

⁵⁵⁵ *Supra* note 63.



- **Arbitrary:** Involves unpredictable or inconsistent royalty demands or licensing conditions, lacking clear justification or transparency, which undermines legal certainty.
- **Anti-competitive:** Describes the use of SEP dominance to suppress market entry, extract supra-FRAND royalties, or coerce implementers into bundled or unfair agreements.
- **Discriminatory:** Occurs when similarly situated licensees are treated unequally without objective justification, violating the “non-discriminatory” prong of FRAND.

With defining what FRAND is not, the BAAD framework offers a negative yet powerful approach that enhances practical enforceability by establishing clearer boundaries for unacceptable SEP licensing practices. It equips regulators and courts with a diagnostic tool to assess the fairness and legality of licensing terms, moving beyond abstract principles to concrete indicators of non-compliance. This approach reduces the scope for strategic exploitation such as patent hold-up, hold-out, and forum shopping—by directly targeting problematic behaviors. Importantly, it also supports developing countries by fostering a more accessible and predictable licensing ecosystem, better aligned with their innovation goals and broader public interest imperatives.

In this way, the BAAD Framework strengthens FRAND governance by translating abstract commitments into actionable criteria laying the groundwork for a more coherent, balanced, and globally fair SEP licensing regime.

OPERATIONALIZING BAAD: SMART CONTRACTS AND BAAD RATES AS TOOLS FOR TRANSPARENT FRAND LICENSING

The BAAD framework becomes truly effective when applied through a structured assessment of SEP licensing conduct. It focuses on identifying practices that violate FRAND obligations by examining:

1. **Conduct of Parties** – Whether both SEP holders and implementers engage in good-faith negotiations. Delays, refusal to negotiate, or lack of information disclosure are red flags.
2. **Transparency of Offers** – Offers must include detailed patent information, claim charts, and royalty calculations. Lack of clarity suggests biased intent.
3. **Economic Justification** – Royalty rates must reflect the value of the patented technology, not the standard. Arbitrary rates or unjustified terms are anti-competitive.
4. **Consistency** – SEP holders must treat similarly situated licensees equally. Unexplained differences point to discriminatory behavior.
5. **Impact on Competition** – Any practice leading to patent hold-up, royalty stacking, or market exclusion is a strong indicator of anti-competitive licensing.



Together, these criteria help courts, regulators, and parties detect Biased, Arbitrary, Anti-competitive, and Discriminatory (BAAD) practices.

A DIGITAL REFEREE

To operationalize these principles, especially in developing countries, the BAAD framework can be embedded into *smart contract systems* that automate and enforce transparent, fair, and non-discriminatory SEP licensing terms. Smart contracts will set the final price, but it flags rates that are: Biased, Arbitrary, Anti-Competitive & Discriminatory. This smart contract would be fed information from trusted sources—like a collective database of past licensing deals, court rulings, and market data. The below mentioned examples provide an insight into the detection of BAAD rates through smart contracts:

- **Biased:** A car manufacturer needs a patent for a specific Bluetooth technology. The smart contract looks at a database of similar car manufacturers that have licensed this same patent. It sees that the average royalty rate for those companies is about \$1 per car. If the patent holder then asks this new manufacturer for \$5 per car, the smart contract would flag the rate as "Potentially Biased" because it's five times higher than the market average.
- **Arbitrary:** A smartphone maker is asked to pay a royalty of \$7 per phone. They ask the patent holder, "Why \$7?" If the patent holder says, "It just feels right," and can't provide any public document, formula, or calculation to back up that number, the smart contract would flag the rate as "Arbitrary" because it has no logical basis.
- **Anti-Competitive:** A patent holder has a patent essential for a smartphone's camera. They offer a license to a phone manufacturer, but only if the manufacturer also agrees to only use the patent holder's non-essential patents also. The smart contract would be programmed to recognize this kind of "bundling" and flag it as "Anti-Competitive" because it unfairly forces the manufacturer to use a specific service.
- **Discriminatory:** A large TV manufacturer is given a royalty rate of 5 cents per TV for a certain video compression patent. A smaller, new TV manufacturer that sells a similar number of TVs is asked to pay 10 cents per TV for the same patent. The smart contract would look at both companies, see they are similar in size and product, and flag the higher rate as "Discriminatory" because the two companies are not being treated fairly.

Moreover, any dispute over rate caps or implementation of terms can be resolved through a *fast-track arbitration mechanism*, ensuring efficient and low-cost resolution of conflicts. Thus, smart contracts can embed non-discriminatory royalty rules, automate transparent payment mechanisms, and flag inconsistent



licensing behavior converting FRAND compliance from a subjective negotiation into a verifiable, code-based process.

CONCLUSION

In redefining FRAND through the lens of BAAD Rates; Biased, Arbitrary, Anti-competitive, and Discriminatory conduct—this paper advances a shift from abstract principles to enforceable behavioral benchmarks. The BAAD framework not only clarifies what FRAND is not, but also offers regulators, courts, and licensing parties a concrete, context-sensitive tool for evaluating real-world conduct. For developing countries, where regulatory capacity and bargaining asymmetries often skew licensing negotiations, this framework helps rebalance the SEP ecosystem by equipping institutions with actionable standards for identifying exploitative practices and enabling better-aligned dispute resolution. Looking ahead, the integration of the BAAD framework with emerging technologies such as smart contracts offers a promising avenue for strengthening compliance and reducing litigation burdens. While legal and technical challenges remain especially around adaptability and cross-border enforceability—the potential for greater transparency and consistency is undeniable. For developing countries, pairing BAAD with such digital enforcement tools could catalyze a shift from reactive enforcement to proactive compliance, fostering an SEP licensing landscape that is not only legally robust but also technologically future-ready.



CHAPTER 18

FRAND LICENSING AND MARKET FAIRNESS: AN ANALYSIS

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ABSTRACT

*FRAND licensing of essential patents (SEPs) has more focus on the Cross-border IP and dynamic law. Subsequently SEPs are the vital elements to standard technologies, particularly in telecommunications and Internet of Things, the equitable and practicable terms of licensing predominate an important position in competitiveness in the innovation and industry level. The Research paper debates how a robust FRAND framework can grant the equal opportunity to SEPs and especially in developing countries. Recent hostilities over the world *Lenovo v. Ericson* and *Samsung v. ZTE* in the U.K. have enshrined about the interim FRAND licenses which permits the entry to the industry during the final negotiations of terms. Meanwhile China, India and South East Asian Jurisdictions show the views on the Jurisdictional conflicts over the determination of global FRAND rates which is about the forum shopping and inability of legal standards. Among the comparative legal analysis, the paper explores court procedures, regulations and patent pools in India, U.K, China and South East Asia. It lays down the SEP licensing in a wider context of digital inclusion and equity of innovation; the research paper deals with the problems of irregular enforcement of FRAND and how it diminishes the accessibility and uplifts the legal action. The paper concludes with the harmonisation of FRAND with social welfare, its variable implementation by different jurisdiction is likely to endanger fairness, affordability and innovation in emerging economies.*

KEYWORDS: FRAND Licensing, Standard Essential Patents, Digital Inclusion, Innovation Equity, Interim Licensing

INTRODUCTION

Visualise the universe in which all telecommunications communication runs solely inside their personal company in which any portable company is unable to link towards wireless internet except if the device remains manufactured through such an equivalent business similar to that network hub. Along with minor start-ups are required to recreate the essential methods simply for trading its goods. Creativity inside the universe might

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appear confused, broken as well as extremely biased. The situation stands in order to hinder the given specific case in which Standard Essential Patent (SEP) occurs. These function in the role of those “common languages” relating to innovation securing which gadgets systems together with frameworks have the ability to interact effortlessly throughout boundaries and sector.⁵⁵⁶ However, SEPs enable cross-border interconnection achievable. Such Patents moreover bring up any important concern. By what means shall the stakeholders ensure in order that availability towards the given patents continues impartiality. Mainly with respect to medium sized firms who do not have these facilities possessed by digital dominant firms. Within these cores tied to the certain principles stand on Standard Essential Patent (SEP). Patents which safeguard such specific innovations allowing cross- border system co-operation.⁵⁵⁷ In the absence of SEP contemporary interaction accessibility together with invention could break down toward divided networks alienating minor sectors along with stopping such entities away from rivalling throughout worldwide trade. Since Standard Essential Patents remain compulsory in order to whoever creating regulation- following goods its owners exist as obligated for the purpose of license these patents under Fair (just), Reasonable(logical) and non-discriminatory (neutral) requirements.⁵⁵⁸

Such an Equitable Framework happens to be designed for the purpose of incentivize, creativity whereas safeguarding equitable opportunity towards vital innovations throughout sectors extensive as well as minor. During the operation, yet this implementation about Fair, Reasonable and Non - discriminatory terms licensing proves to be significantly away from transparent.⁵⁵⁹ In the case of Small and medium - sized companies, such barriers remain still more significant.⁵⁶⁰ Unlike extensive companies, SMEs frequently miss that negotiation capacity and monetary capacity in order to reject licensing fees otherwise involved within complicated judicial proceedings. As an Instance, throughout India emerging mobile phone makers including Micromax and Intex dealt with risky judicial conflicts against Ericsson about Standard Essential Patent contractual conditions, and which these companies asserted existed as disproportionate along with prejudiced.⁵⁶¹ This sort of disagreement

⁵⁵⁶ World Intellectual Property Organization, Standard Essential Patents, <https://www.wipo.int/en/web/patents/topics/sep>

⁵⁵⁷ Digvijay Singh & Rajnish Kumar Singh, Licensing of Standard Essential Patents on FRAND Terms in India, 24 J. Intell. Prop. Rts. 149, 149–59 (2019), <https://nopr.niscpr.res.in/bitstream/123456789/54318/1/JIPR%2024%285-6%29%20149-159.pdf>.

⁵⁵⁸ Harsh Kashyap, SEP and FRAND Licensing in India, Lawful Legal (Sept. 8, 2025), <https://lawfullegal.in/sep-and-frand-licensing-in-india/>.

⁵⁵⁹ Chrysoula Pentheroudakis & Justus A. Baron, Licensing Terms of Standard Essential Patents: A Comprehensive Analysis of Cases, EUR 28302 EN (2017), <https://publications.jrc.ec.europa.eu/repository/bitstream/JRC104068/jrc104068%20online.pdf>.

⁵⁶⁰ Stefano Barazza, Standard Essential Patents and FRAND Licensing: The Evolution of the European Approach, in Developments and Directions in Intellectual Property Law 493, 493–510 (Hayleigh Bosher & Eleonora Rosati eds., Oxford Univ. Press 2023).

⁵⁶¹ Ericsson v. Micromax & Intex SEP Row: Delhi HC Refuses Stay Against Investigation by CCI, <https://blog.iplayers.in/ericsson-vs-micromaxintex-sep-row-delhi-hc-refuses-stay-investigation-cci/>



emphasizes the way in which SEP implementation has the potential to limit emerging competitors away from developing nor rivalling based on equivalent conditions. Across the globe likewise, emerging companies battle in the face of an inconsistent regulation. During *Unwired planet vs Huawei* that UK bench enforced international Fair, Reasonable and Non-Discriminatory licensing charges in spite of UK's commercial space representing exclusively one part from such quarrel.⁵⁶²

This kind of decision provoked issues relating to abuse of power from SEP holders specifically harming companies within small industries who are without a powerful statutory shield.⁵⁶³ Such a situation causes minor businesses exposed towards excessive expenses together with curtailed opportunity relating to such innovations those industries demand for the purpose of progress. With respect to the evolving nations including India, China together with regions across south-East such deficiency associated with integrated cross-border principles causes vagueness as well as extends that separation connecting patent holders along with medium sized manufacturing operators⁵⁶⁴. Whatever took place initially aimed to ensure justice holds within reality transform into any judicial battle together with trade-related clash about availability, fairness and competition. This research aims towards objectively analyse the aforementioned International and territorial framework related to FRAND licensing along with unique attention about their consequences regarding business equity among the small industries. The study examines in what way inequalities under legislation along with implementation impact creativity, competition and technological incorporation. With the help of examining the aforementioned practice of FRAND throughout courts, such research points out such immediate requirements relating to integrated arrangements which assure fair availability towards necessary techniques, protect small industries and promote comprehensive collaboration within the world-wide modernization industry.⁵⁶⁵

ANALYSIS OF FRAND WITH SEP'S INNOVATION EQUITY & DIGITAL INCLUSION

Although the concept of FRAND is meant to be a check on fairness, in practice it can be quite different. The fair and reasonable commitment in the licensing is to make sure that the cost is in the real value of the patented technology. In most cases however, licensors are charging unreasonably high royalties or packaging whole patent portfolios into one license deal. This is so oppressive, it can

⁵⁶² *Unwired Planet Int'l Ltd. v. Huawei Techs. Co. Ltd.*, [2020] UKSC 37 (appeal taken from Eng.), <https://www.supremecourt.uk/cases/docs/uksc-2018-0214-judgment.pdf>.

⁵⁶³ <https://publications.jrc.ec.europa.eu/repository/bitstream/JRC104068/jrc104068%20online.pdf>.

⁵⁶⁴ Stefano Barazza, *Standard Essential Patents and FRAND Licensing: The Evolution of the European Approach*, in *Developments and Directions in Intellectual Property Law 493*, 493–510 (Hayleigh Bosher & Eleonora Rosati eds., Oxford Univ. Press 2023)

⁵⁶⁵ World Intellectual Property Organization, *Standard Essential Patents*, <https://www.wipo.int/en/web/patents/topics/sep>



render the entry into the market prohibitively costly to smaller innovators⁵⁶⁶ as witnessed in recent mobile network SEP litigation where the portfolio fees were vastly more expensive than individual patents.⁵⁶⁷ Equity, in relation to non-discriminatory access, has a similar purpose in the sense that, by pledging not to discriminate in the provision of such access, the pledgers intend to offer equal opportunities to all market players who will have the same chance to access essential technologies, regardless of their size or location. Market concentration by a small number of powerful SEP holders in practice, however, has limited access by SMEs and emerging-market innovators.⁵⁶⁸ The restrictions imposed on the laws of licensing of IoT developers and 5G providers of infrastructure in African and South Asian economies can show how this paradigm can be made exclusive.

Another pillar of FRAND is transparency in royalty computation, in which again, practice is falling behind principle. The fees may be inflated by basing royalties on the whole end product as opposed to the smallest component that can be sold. This is further complicated because in licensing talks the common practice is to sign non-disclosure agreements (NDAs). Although NDAs may be used to safeguard commercial information that will be regarded as sensitive, they will keep the dissimilarity of prices that varies across the border, not to mention the inability to determine whether the terms that will be provided will indeed be considered FRAND.⁵⁶⁹ Lastly, FRAND has the vision of allowing fair adoption of technology worldwide so that communities across the globe enjoy the benefits produced through innovations. However, the fact is that the expensive cost of licensing slows down deployment in low-income areas, fortifying the digital divide. In portions of Asia and Latin America, rural broadband efforts have been derailed by the burden of licensing requirements and millions of people remain unlinked to the digital lifeblood and its economic and social opportunities.⁵⁷⁰

⁵⁶⁶ David Kennedy & Larry Tedesco, *FRAND Royalty Rates in SEP Licensing: Comparable Licence Agreements*, IAM Innovation & Invention Yearbook (Nov. 20, 2020), <https://www.iam-media.com/global-guide/innovation-invention-yearbook/2021/article/frand-royalty-rates-in-sep-licensing-comparable-licence-agreements>

⁵⁶⁷ Koren W. Wong-Ervin, *Methodologies for Calculating FRAND Royalty Rates and Damages*, Fed. Trade Comm'n (Oct. 22, 2014), https://www.ftc.gov/system/files/attachments/key-speeches-presentations/wong-ervin_aba_program_frand_royalty_rates_10-22-14.pdf

⁵⁶⁸ Sakina Kapadia & Akshat Mishra, *Standard Essential Patents: Bridging Innovation and Fair Practice*, Bar & Bench (Jan. 22, 2025), <https://www.barandbench.com/view-point/standard-essential-patents-bridging-innovation-fair-practice>

⁵⁶⁹ https://www.thesedonaconference.org/sites/default/files/1_3-Sedona%20WG9%20SEP-FRAND%20Framework%20Global%20Ed_Nov_2021_ver.pdf

⁵⁷⁰ Valéria Silva, *FRAND-Licensing Litigation Across the Atlantic: A Comparative Assessment of US and UK Jurisprudence on Telecom Disputes*, ICLE Issue Brief (Apr. 8, 2025), https://laweconcenter.org/wp-content/uploads/2025/04/Article_FRAND_VS_9_EN-2025-04-07.pdf



LITERATURE REVIEW

The FRAND or Fair, Reasonable and Non-Discriminatory licensing principle has become a vital principle that manages the licensing of Standard Essential Patents (SEPs) in the comprehensive innovation framework on a universal scale.⁵⁷¹ With uniformity becoming core to tech advancement and the capacity of innovation or markets to unify, the lawful, commercial, and strategy aspects of FRAND obligations have compelled the focus of researchers and courts alike⁵⁷². This review demonstrates an in-depth analysis of the theory of FRAND licensing and its function in the advancement of fairness in the industry, by emphasizing especially on the idea of competition law and its investigation of governing framework.

Standard Setting Organizations (SSOs) usually enforce FRAND requirements on SEP holders to resolve the conflicting interests in the right to ownership patent against the transformation to become a transparently approachable innovations and diffuse advancement of merit.⁵⁷³ The concepts reflected in FRAND undertakings include fair treatment of licensees by enhancing transparency in licensing discussions and abatement of coercive/exploitive practices; basing licensing conditions upon the economic worth of the technology patented which is frequently calculated through parallel market-oriented standards and patterns of licensing experience; and requiring an identical treatment of comparable licensees to prevent unequal or exclusivity measures.⁵⁷⁴ Ultimately, these are the principles which, standing altogether, help to reduce the chances of SEP holders using the monopoly power after the standards were established, maintaining the competitive and open environment on the technologies market.⁵⁷⁵

In the view of the competition law, the FRAND commitments serve as the regulatory measures to prevent the anti-competitive conduct on the part of SEP owners with the pertinent share. An instance

⁵⁷¹ World Intellectual Property Organization, Standard Essential Patents, <https://www.wipo.int/en/web/patents/topics/sep>

⁵⁷² Harsh Kashyap, SEP and FRAND Licensing in India, *Lawful Legal* (Sept. 8, 2025), <https://lawfullegal.in/sep-and-frand-licensing-in-india/>.

⁵⁷³ Siddharth Jadhav, Competition and Antitrust Law Enforcement Against Standard Essential Patents in India, JETIRGT06009, <https://www.jetir.org/papers/JETIRGT06009.pdf>.

⁵⁷⁴ Chrysoula Pentheroudakis & Justus A. Baron, Licensing Terms of Standard Essential Patents: A Comprehensive Analysis of Cases, EUR 28302 EN (2017), <https://publications.jrc.ec.europa.eu/repository/bitstream/JRC104068/jrc104068%20online.pdf>.

⁵⁷⁵ Stefano Barazza, Standard Essential Patents and FRAND Licensing: The Evolution of the European Approach, in *Developments and Directions in Intellectual Property Law 493, 493–510* (Hayleigh Bosher & Eleonora Rosati eds., Oxford Univ. Press 2023) Stefano Barazza, Standard Essential Patents and FRAND Licensing: The Evolution of the European Approach, in *Developments and Directions in Intellectual Property Law 493, 493–510* (Hayleigh Bosher & Eleonora Rosati eds., Oxford Univ. Press 2023)



is in India where the Competition Act, 2002 specifically Section 4 on abuse of dominance, uses a regulatory structure to contest licensing operation that tend to influence competition (and market) deviation⁵⁷⁶. Jurisprudence-based determination making in diverse legal authority has emphasized the possibility of un fair and non-restrictive licensing, due to the supremacy of uniformed digital systems in enterprises such as broadcasting and data-driven technology. Significant issues like patent obstruction, whereby proprietors of SEPs claim unjustified rates of royalties to be paid even after the implementation of a technical system, and overlapping charges by several SEP owners are the two dominant concerns under FRAND to protect market-driven fairness in the industry.⁵⁷⁷

Still, FRAND licensing persists to be the subject of theoretical and functional modifications. Fairness and appropriate do not have worldwide accepted norms, which makes courts and arbitration-related outcomes intricately.⁵⁷⁸ The unequal interpretation and implementation of FRAND guarantees in diverse jurisdictions are a hindrance to formation of standardized international licensing mechanisms. In addition, there are new regulatory and policy considerations posed by the adaptation of FRAND standards into emerging fields, which include unprotected areas like data information and virtual networks. These issues will need to be managed through reconsidering standard-setting foundations of FRAND and a desire to create adaptable but effective systems that can meet digital tools and market intricacy.⁵⁷⁹ FRAND licensing serves a crucial role between the intellectual property rights, competition policy and governance in the industry. Although its foundational principle strives to enable advancement incentives to be moderated with attainability on a fair basis, effective implementation on its promises is reliant on responsive regulatory approach-structural and successful systematic structures. The workability and marketplace need to have the observability, non-arbitrary

⁵⁷⁶ Competition Commission of India, Provisions Relating to Abuse of Dominance Under the Competition Act, 2002, https://cci.gov.in/public/images/publications_booklet/en/provisions-relating-to-abuse-of-dominance1652177254.pdf.

⁵⁷⁷ Dr. Kalyan Kankanala, Exploring Patent Hold Up, Royalty Stacking, and Hold Out – Ericsson v. Lava, Intellopedia (Apr. 19, 2024), <https://www.bananaip.com/intellopedia/ericsson-v-lava-patent-hold-up-royalty-stacking-frand/>.

⁵⁷⁸ Peter G. Picht & Gaspare T. Loderer, Arbitration in SEP/FRAND Disputes: Overview and Core Issues, 36 J. Int'l Arb. 575, 575–94 (2019), https://www.ius.uzh.ch/dam/jcr:32d2c1e3-21ca-4e0b-a175-dad6bdd10272/Picht_Loderer_Arbitration%20in%20SEP-FRAND%20Disputes_JOIA%202019_575-594.pdf.

⁵⁷⁹ Kathy Berry, EU – The Data Act: A FRANDly Approach to Data Licensing, Linklaters DigiLinks (Feb. 2, 2024), <https://www.linklaters.com/insights/blogs/digilinks/2024/february/eu---the-data-act---a-frandly-approach-to-data-licensing>



nature and enforceability of the FRAND obligations to be improved as the level of technological innovation rises and channels of marketplace become more intertwined.⁵⁸⁰

COMPARATIVE STUDY OF FRAND LICENSING

FRAND (Fair, Reasonable, and Non-Discriminatory) licensing regulates the use of Standard Essential Patents (SEPs), by facilitating the technological access to patent while safeguarding the innovation. This study examines how India and the European Union adopted the FRAND framework. In European Union, Frand licensing is governed by competition law and other landmark rulings, mainly in the case of *Huawei v. ZTE* it states how standard essential patent holders should act while seeking the FRAND licensing temporary injunction⁵⁸¹. European commission also focuses on fraud that are happening in standard essential patent and also develops the way to protect the transparency and legal certainty. Market based criterion and comparable licensing is used to determine the royalty rates.⁵⁸² India is still in the state of evolving. In the case of *Ericsson v. Micromax*, Delhi high court stated the royalty dispute, patent infringement and Abuse of dominance. Delhi high court also imposed the Interim Royalties and promotes FRAND licensing in India. Even though India lacks on SEP essentiality assessments and standardized royalty benchmark and having the limited regulatory Intervention.⁵⁸³ In Contrast to European well codified framework, India SEP is fragmented and remains Ad hoc. To develop and strengthen the FRAND compliance, formulation of royalty benchmark and Standard setting organization was needed. Aligning with global FRAND standards is essential for developing the innovation and promoting the fair access to the technology. This comparative analysis emphasis the need for legal standards and institutional framework to balance patent enforcement with public benefit.

COMPETITION LAW AND SEP LICENSING

The Competition act 2002 plays a vital role in regulating the SEP related frameworks in India. Section 3 prohibits the anti-competitive agreements and section 4 deals with the abuse of dominant market positions. The Competitive commission of India (CCI) has investigated the SEP holders such as Ericsson⁵⁸⁴ for the

⁵⁸⁰ Harsh Kashyap, SEP and FRAND Licensing in India, Lawful Legal (Sept. 8, 2025), <https://lawfullegal.in/sep-and-frand-licensing-in-india/>

⁵⁸¹ Case C-170/13, *Huawei Technologies Co. Ltd v. ZTE Corp.*, 2015 E.C.R. I-477, available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A62013CJ0170>

⁵⁸² David Kennedy & Larry Tedesco, *FRAND Royalty Rates in SEP Licensing: Comparable Licence Agreements*, IAM Innovation & Invention Yearbook (Nov. 20, 2020), <https://www.iam-media.com/global-guide/innovation-invention-yearbook/2021/article/frand-royalty-rates-in-sep-licensing-comparable-licence-agreements>.

⁵⁸³ Sahithya Muralidharan, *Ericsson v. Micromax – A Kick-Start to SEP-FRAND Antitrust Jurisprudence in India*, Kluwer Competition Law Blog (July 13, 2016), <https://legalblogs.wolterskluwer.com/competition-blog/ericsson-v-micromax-a-kick-start-to-sep-frand-antitrust-jurisprudence-in-india/>

⁵⁸⁴ MM Sharma, *Debate on SEP under FRAND Terms Revives in India – Ericsson Wins Second Round Before Delhi High Court*, Competition Lawyer Blog (Oct. 24, 2023), <https://www.competitionlawyer.in/debate-on-sep-under->



violation of this provision of competition act. Section 27 also provides the power to CCI for imposing the penalties and provides the remedial measures for the SEP licensing and regulates the merger and acquisition which makes a negative impact on market fairness⁵⁸⁵. Standard essential patents intersect the competition law and the intellectual property law especially in economic technical sense. In Standard essential patents there was double regulatory frameworks in which patent law excludes the innovators and protect the innovation whereas Competition law ensures that exclusivity does not create a market abuse. This double regulatory framework creates a conflict of jurisdictional clashes between CCI and civil courts.

Royalty stacking is one of the significant issues in Standard essential patents. It creates when multiple patent holders demand patent for the same technological standards which raise compliance concerns under section 3 and 4 of competition act. It also violates the competitive principles like Excessive pricing, discriminatory licensing and the entry barriers. To align a SEP standard with competition law there should be a need of some policy recommendations which ensures public disclosure for SEP portfolio, codification of India's FRAND guidelines and mandatory review mechanism.⁵⁸⁶ Furthermore, SEP enforcement to market foreclosure can lead to competition act to mandate the Compulsory licensing and protect the public interest. Ultimately Integrating the competition law and SEP will foster the innovation and fair technological access in the global landscape.

ROLE OF INTERNATIONAL NEUTRAL DISPUTE RESOLUTION IN RESOLVING CROSS-BORDER SEP AND FRAND CONFLICTS

Licensing of Standard Essential Patent (SEP) and the availability of fair FRAND (Fair, Reasonable and Non- Discriminatory) are one of the most contested areas of international law. SEP litigation is no longer a factor of the U.S. or Europe as it is increasingly being played in various countries with other countries becoming key players within the global tech ecosystem⁵⁸⁷. In the present day, cross-border disputes have become highly complex with jurisdictional issues, scope of licensing and enforcement rights to contend with. Such challenges can be explained by recent international cases.

frand-terms-revive-in-india-ericsson-wins-the-second-round-before-delhi-high-court-smartphone-patent-wars-continue-in-india

⁵⁸⁵ Siddharth Jadhav, *Competition and Antitrust Law Enforcement Against Standard Essential Patents in India*, JETIRGT06009 (2024), <https://www.jetir.org/papers/JETIRGT06009.pdf>

⁵⁸⁶ Biplab Kumar Lenin & Harsha Rohatgi, *Exceptions and Limitation of Patent Rights and Its Enforcement in India*, 20 JIPR 297 (2015), <https://docs.manupatra.in/newsline/articles/Upload/68811C66-E206-4E36-AB5A-415E9B19395B.pdf>

⁵⁸⁷ Wen tong Zheng, *Weaponizing Anti-Suit Injunctions in Global FRAND Litigation*, 30 Geo. Mason L. Rev. 413, 415–16 (2023), https://lawreview.gmu.edu/print_issues/weaponizing-anti-suit-injunctions-in-global-frand-litigation.



In *Ericsson v. Samsung*, the aspect of anti-suit injunctions (ASIs)⁵⁸⁸ in various jurisdictions was seen as an example of how struggles of forum issues can intensify. The competing orders were issued by the courts in the various countries, which resulted in tensions on who had the mandate to settle global FRAND terms.

Another case of *Ericsson v. Samsung* provides that further insight into the problem of imposition and accessibility in international licensing of FRAND and SEP. The battle first started when there was a simultaneous filing of lawsuits by the holders and enforcers of Standard Essential Patents (SEPs) in various jurisdictions⁵⁸⁹. Whereas Ericsson had filed in the United States, Samsung took parallel proceedings in China itself at the Wuhan intermediate people court. In similar ways to the *Interdigital v. Xiaomi* case, Samsung had applied and secured an anti-suit injunction in the Chinese court to bar Ericsson to pursue its action in the U.S relating to FRAND terms of license. The U.S. court later responded by granting an anti-anti-suit injunction, and this example demonstrates that issues of SEPs across borders can easily develop into problems of jurisdiction clashes. Such strategies pose a serious issue regarding access to Just legal remedies with the possibility of avoiding or preventing a party trying to obtain redress in a jurisdiction of their choosing. Licensing of SEPs internationally has resulted in many instances of overlapping jurisdictional conflict in which different courts are sought to grant relief. Another challenge is forced use of foreign judgments and the availability of justice in the local jurisdiction of which the offense is committed.

An example of the grand illustration of this is *Interdigital v. Xiaomi*⁵⁹⁰ the Delhi High Court awarded the first anti-enforcement injunction in India in Favor of an order an order issued by the Wuhan People Court which had attempted to bind Interdigital against pursuing claims in India.

This is a case that illustrates how courts address a conflict of forum, particularly when:

- A party will issue a foreign judgment to prevent the proceedings in the place of infringement.⁵⁹¹

⁵⁸⁸ Rahul Jain & Rushika Bakshi, *Comprehensive Analysis of SEP Litigation: Understanding Anti-Suit Injunctions and FRAND Licensing in India & USA*, Hammurabi & Solomon (Aug. 4, 2025), <https://www.mondaq.com/india/patent/1660582>.

⁵⁸⁹ *Munich Court Confirms AAAASI in SEP Battle Between Interdigital and Xiaomi*, JUVE Patent (Feb. 2021), <https://www.juve-patent.com/cases/munich-court-confirms-aaaasi-in-sep-battle-between-interdigital-and-xiaomi>

⁵⁹⁰ *Interdigital Tech. Corp. v. Xiaomi Corp.*, I.A. No. 8772/2020 in CS(COMM) 295/2020, Delhi High Court (May 3, 2021), available at Delhi High Court Judgment.

⁵⁹¹ Tamanna Sharma, *India: Interdigital Vs. Xiaomi: India's First Anti-Enforcement Injunction Order*, Mondaq (June 25, 2021), available at Mondaq Article



- The local jurisdiction (India) lays stress on cause of action and equity and the public interest.
- Legal protections in the form of confidentiality clubs and indemnity orders are also enforced to maintain proprietary data and legal battles in a fair manner.

The Delhi High Court did not permit the foreign court to restrict access to justice in India. It upheld the rights of Interdigital⁵⁹² to fix its patent rights in the Indian territory. In the case, despite the original complaint of patent violation, the source of the dispute was the negotiations of FRAND conditions. Anti-Enforcement Injunction allowed India to have a separate stand on deciding FRAND terms since it was determined through the judicial process in India. The fact that a two-tier confidentiality club was created after some had expressed concerns regarding accessibility and fairness in court proceedings litigation especially in the negotiations surrounding sensitive commercial terms in licensing seemed to suggest the necessity of striking a balance. It established a precedent in which Indian courts will not allow them to indulge in a process known as a forum shopping in denying the parties the right to Indian remedies⁵⁹³. This shows that SEP disputes tend to evolve into global courtroom war instead of being solved within reasonable bounds of a licensing negotiation⁵⁹⁴. In order to overcome such challenges, parties frequently seek negotiation and use of alternative dispute resolution (ADR) as a way of settling the disputes prior to attempting litigation. The alternative forms of a dispute, such as mediation and arbitration, may have a more informal and confidential approach towards the issue of resolving a dispute over licensing terms, essentiality or royalty rates. Nevertheless, in cases where these systems do not work, there is an inevitable need to involve court litigation which is associated with procedural as well as jurisdictional complexities.⁵⁹⁵ The practices held to be important by SEP owners, to the owners of SEPs, include transparency, good faith negotiations and offering reasonable portfolio licenses. They should state explicitly whether the patent is deemed significance and they should not withdraw when it comes to discussions on fair licensing. In their turn, implementers are also compelled to negotiate in good faith but having the right to challenge the patent validity and necessity.

⁵⁹² *Interdigital Tech. Corp. v. Xiaomi Corp.*, supra note 1

⁵⁹³ Hansika Gupta, *Exploring Alternative Dispute Resolution: The Practice of Forum Shopping*, Vivekananda Inst. of Prof. Studies, Int'l J. Legal Res. & Analysis (2023), available at IJLRA

⁵⁹⁴ *Guidance: Dispute Resolution and Remedies in SEP Licensing*, OPUS IP (July 22, 2024), available at OPUS IP

⁵⁹⁵ *SEP/FRAND Disputes: Arbitration or Litigation?* Akin Gump (2021), available at Akin Gump Insights



Lastly, the cooperation frameworks have to be supplied so as to realize the balance between the imposition and accessibility. Contributing to the effective dialogue and ethical behaviour, the owners and implementers of SEP will get a chance to foster technical development and make common technologies more accessible and commonly used, especially in regions of the world where the digital structure is being built. For the purpose of grasp such rising value relating to worldwide impartial clash settlement within SEP and FRAND licensing legal disputes, it becomes essential in order to analyse this data-driven context in relation to Indian technology along with the telecommunications industry. Contemporary lawsuits values, trade capacities and records usage increase grant quantifiable observations towards the monetary burden over start-ups together with SMEs whenever challenged by cross-border SEP conflicts. This below tabulation demonstrates significant data driven metrics which situated that scope of the issue along with requirement about trustworthy conflict settlement procedures.

CONCLUSION

The licensing framework of FRAND, meant to balance the rights of the Standard Essential patent (SEP) holders with, simultaneously, providing open access to the essential technologies, still remains to be fraught with consistent legal and commercial issues.⁵⁹⁶ The lack of a common definition relating to the meaning of the terms to be considered as fair, reasonable, and non-discriminatory has resulted in the proliferation of various interpretations in courts of different jurisdiction, which is evident regarding *Huawei Technologies Co. Ltd. v. ZTE Corp.* (CJEU, 2015), where the court emphasized the necessity in terms of the clarity of the process.⁵⁹⁷ International standard-setting organisations and policymakers ought to help in a common definition of FRAND and objective valuation benchmarks to reduce the effect of such uncertainty. Royalty stacking and excessive pricing can be seen as a challenge to affordability and fair marketplace participation, especially with SMEs. The promotion of patent pooling mechanisms, such as the use in the MPEG LA model, might facilitate the licensing and curb the total the royalty burdens.⁵⁹⁸ Likewise, the hold-up and hold-out concerns (illustrated in the *Unwired Planet International Ltd. v. Huawei Technologies Co. Ltd.* (UKSC, 2020) case) may require introducing both compulsory mediation and fast-track arbitration under the international frameworks operating beyond the specifications of a particular jurisdiction.⁵⁹⁹

⁵⁹⁶ Peter G. Picht, *FRAND and the EU Court of Justice: Guidance for Licensing Standard Essential Patents*, 10 J. Eur. Competition L. & Prac. 297, 297–303 (2019).

⁵⁹⁷ Case C-170/13, *Huawei Techs. Co. Ltd. v. ZTE Corp.*, ECLI:EU:C:2015:477 (July 16, 2015)

⁵⁹⁸ MPEG LA, *Patent Pooling and Licensing Programs*, <https://www.mpegla.com/programs/>

⁵⁹⁹ *Unwired Planet Int'l Ltd. v. Huawei Techs. Co. Ltd.*, [2020] UKSC 37 (appeal taken from Eng.), <https://www.supremecourt.uk/cases/docs/uksc-2018-0214-judgment.pdf>.



There is a lack of transparency in the SEP licensing process, largely due to the narrowly found in the NDAs, which makes it not possible to establish equitable rates. Regulations changes may require disclosure of anonymised royalty solvation where confidentiality and competition needs of a market are in balance. The issue of jurisdiction, such as in the case of Interdigital Technology Corp. V. Xiaomi Corp. (Delhi High Court, 2021) demonstrates how a harmonized internationally coordinated framework would be required to eliminate the parallel dispute of what had optimistically been termed as the “anti-suit” and “anti-anti-suit” injunction wars. To guard against discrimination in terms of licenses, competition regulators will need to keep a close eye on forces in ensuring that the FRAND requirements are fulfilled, citing success based on previous instances such as the antitrust action taken against Qualcomm Inc. And Motorola Mobility by the European Commission.⁶⁰⁰ Lack of regulatory framework is one of the problems why new ventures and IoT creators are usually underprivileged because they lack the statutory resources; therefore, a collective licensing forum, FRAND rates that objectifies the SMEs, and approach to legal aid program which could help. Lastly, the brittle connection between FRAND ventures and competition law obliges visionary policy orientation that would sustain recognized patent rights and endure abuse of dominance. So, in conclusion, by endorsing legitimizing, lucidity, accountability and contributing proportionality in FRAND licensing structure fulfilment and capability of which is the necessary conditions however its requisites in same approach settlement that aligns in this return enabling further novel advancement.⁶⁰¹ Through the implementation of these initiatives, stakeholders can alleviate legal proceedings, create steadier cross-border licensing and uphold that systematized innovative industries which is inclusive, contesting and modernization.⁶⁰²



⁶⁰⁰ Press Release, Eur. Comm’n, Antitrust: Commission Fines Qualcomm €997 Million for Abuse of Dominant Market Position (Jan. 24, 2018), https://ec.europa.eu/commission/presscorner/detail/en/IP_18_354.

⁶⁰¹ Harsh Kashyap, SEP and FRAND Licensing in India, Lawful Legal (Sept. 8, 2025)

⁶⁰² Chrysoula Pentheroudakis & Justus A. Baron, Licensing Terms of Standard Essential Patents: A Comprehensive Analysis of Cases, EUR 28302 EN (2017), <https://publications.jrc.ec.europa.eu/repository/bitstream/JRC104068/jrc104068%20online.pdf>.



CHAPTER 19

EXCLUSIVE PATENTS, EXCLUDING PATIENTS? SEPs, FRAND AND IoMT

- Joshua Joseph* and Aryaa Bhaskar**

ABSTRACT

With the rise of the Internet of Medical Things (IoMT), such as health wearables and hospital technology, there has been more reliance on wireless standards. Such standards are governed by Standard Essential Patents (SEPs), which protect technologies that are essential for interoperability under a technical standard. Even though such patents are licensed under Fair, Reasonable, and Non-Discriminatory (FRAND) terms, issues regarding licensing such technology pose serious challenges to affordability, innovation, and consumer access, particularly in the medical technology sector. As global SEP holders begin asserting rights over embedded standards in IoMT infrastructure, South Asian innovators, especially those in India, will face high transaction costs, opaque royalty structures, and legal uncertainty. Meanwhile, the absence of a sector-specific regulation means that licensing practices affecting life-saving technologies remain subject to general patent and competition law frameworks. Such frameworks are not adequate to deal with the ethical and moral requirements of healthcare access. This paper argues that FRAND licensing impacts India's IoMT ecosystem, particularly in wearable and hospital technology. It further explores domestic legal developments, such as the Competition Commission of India's intervention, and draws comparative insights from other international regimes. The paper aims to provide an integrated legal analysis with a rights-based approach to healthcare and innovation, arguing that current SEP governance could threaten public health objectives in emerging economies.

KEYWORDS: IoMT, FRAND, Standard Essential Patent, India, Healthcare, Patent

INTRODUCTION

In the age of connected medicine, the *Internet of Medical Things* (IoMT) is redefining healthcare. The smooth interoperability of devices like wearable heart monitors, smart infusion pumps, and AI-powered telemedicine hubs is made possible by wireless and data exchange standards like Wi-Fi, Bluetooth Low Energy, 4G/5G, HL7, and FHIR. According to Brainy Insights, the global IoMT market is expected to reach a valuation of 516.40 billion dollars by 2032. In a comparable direction,

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the IoMT market in India is expected to grow to 2.2 billion dollars by 2028. However, there is a legal flaw behind this technological promise. Standard Essential Patents, or SEPs, provide protection for many of these fundamental standards. SEPs, which are licensed under Fair, Reasonable, and Non-Discriminatory (FRAND) terms, are designed to strike a balance between open access and innovation incentives.⁶⁰³ SEP owners have, however, occasionally used their disproportionate power to demand royalties which are not based on the actual value of the patent or to threaten injunctions after a standard has been adopted. Such actions run the risk of delaying the introduction of life-saving equipment and jeopardizing the larger promise of healthcare.⁶⁰⁴ The stakes are especially high for emerging economies like India, where SEP disputes are governed by general patent and competition law rather than sector-specific regulations. Royalties, high transaction costs, and legal ambiguity run the risk of undermining public health goals in the absence of customized safeguards. Access to vital healthcare technologies may be restricted, despite the standards' stated goal of promoting interoperability. This paper aims to provide an integrated legal analysis with a rights-based approach to healthcare and innovation, arguing that current SEP governance could threaten public health objectives in emerging economies. The paper is divided into four sections: The first section will give an overview of SEP and IoMT. The second section will investigate the current jurisprudence of India regarding SEP and how it differs from the EU and the US. The third section will look at the possible impact such a system would have on IoMT. The fourth and final will provide recommendations that India can take up to counter such incidents.

UNDERSTANDING SEPS, FRAND, AND THE INTERNET OF MEDICAL THINGS (IOMT)

Understanding SEP

Standard Essential Patents (SEPs) refer to patents that protect technology deemed essential for complying with a technical standard set by recognised Standard-Setting Organisations (SSOs).⁶⁰⁵ These patents are considered "essential" because it would effectively be impossible to either

⁶⁰³ Brian Scarpelli & Priya Nair, *Healthcare and Standard Essential Patents* (Feb. 28, 2025) (forthcoming in Rutgers U. L. Rev.)CHI-Issue-Paper-Healthcare-and-Standard-Essential-Patents-Feb-202568.pdf

⁶⁰⁴ Timothy Syrett & Annsley Merelle Ward, Standard-Essential Patent Licensing Comes to Medtech, 37 *Intell. Prop. & Tech. L.J.* 3 (2025)

⁶⁰⁵ IAM, *India: SEPs and FRAND - Litigation, Policy and Latest Development*, Lexology (Oct. 22 2024), <https://www.lexology.com/library/detail.aspx?g=8f98f919-1bbd-4920-aad2-85359de5d4fa>



manufacture or use a product that complies with the standards without infringing such SEPs.⁶⁰⁶ An example would be when the workings of a wireless medical device over 4G/5G networks-core components such as the transmission of data, real-time monitoring, and remote diagnostics-are based on patented technologies that fall under the SEP category.

In order to prevent abuses of market power by SEP holders, SSOs usually require that the holders of the patent agree to license their patents on terms of FRAND: Fair, Reasonable, and Non-Discriminatory. As observed by Anne Layne-Farrar, *‘the FRAND commitment can be thought of as a quid pro quo: in exchange for inclusion in a standard, the patent holder commits to granting licenses on FRAND terms and conditions.’*⁶⁰⁷ The goal of FRAND is to walk the line between the inventor's right of profiting from his innovation and the more general need for the standards to be interoperable and accessible through competition. In particular, it aims at

- (i) preventing patent hold-up, which occurs when SEP holders demand exorbitant royalties after a standard has been adopted;
- (ii) ensuring a level playing field for market entrants; and
- (iii) encouraging innovation across industries.⁶⁰⁸

More ambiguity hinders the FRAND licensing scheme in spite of protective intent. There is no universal legal definition for "fair" or "reasonable" and enforcement has been inconsistent across jurisdictions. Between the courts and the regulators, there have been varying difficulty levels in setting consistent standards for issuing decisions. Often, issues have left the implementers, mostly small companies, exposed to questionable royalty regimes, confidentiality agreements, and litigation threats. In such uncertainty of law and economics, the medical sector proves especially problematic.

Understanding IoMT and What Is at Stake

IoMT comprises connected medical devices such as wearable fitness and cardiac monitors, implantable, smart diagnostics, and hospital automation systems. These devices use the same standardised network technologies as consumer electronics and are thus highly dependent on SEPs.

⁶⁰⁶ European Commission, Directorate-General for Competition, Competition Policy Brief: Standard-essential patents (Issue 8, June 2014), https://publications.europa.eu/resource/cellar/c57ffb7-9aeb-11e6-868c-01aa75ed71a1.0001.01/DOC_1

⁶⁰⁷ Anne Layne-Farrar, The Economics of FRAND, in *The Cambridge Handbook of Antitrust, Intellectual Property, and High Tech* 58 (Roger D. Blair & D. Daniel Sokol eds., Cambridge Univ. Press 2017).

⁶⁰⁸ IAM, *India: SEPs and FRAND - Litigation, Policy and Latest Development*, Lexology (Oct. 22 2024), <https://www.lexology.com/library/detail.aspx?g=8f98f919-1bbd-4920-aad2-85359de5d4fa>



However, the consequences of a restrictive SEP licensing in IoMT are not just commercial in nature; they also have an ethical and public health impact, unlike in the telecom or automotive sectors. These licensing practices can have a direct impact on actual accessibility if they raise prices, prevent smaller players from entering the market, or delay access to crucial SEP-covered technologies.

The stakes involved are even higher in providing healthcare delivery through IoMT for rural and underserved settings in India. Indian inventors frequently find themselves faced with high transaction costs, ambiguous licensing terms, and legal uncertainty vis-à-vis SEP owners, many of whom are multinational entities with huge patent portfolios. Since India does not have a sector-specific legal regime for medical technologies, issues relating to access, affordability, and licensing are currently governed by general patent and competition laws that are truly very broad in nature and are commercially oriented. Their domain was never created with the special requirements of public health in mind. Hence, the regulation of life-saving medical technologies especially those which run on standardised wireless protocols protected by Standard Essential Patents falls into a legal grey area.

A CRITICAL DISTINCTION: LIFE-CRITICAL VS. WELLNESS IOMT

Life-Critical IoMT

Devices that require continuous, real-time data flow for patient safety are classified as life-critical IoMT. For instance, a hospital's Electronic Health Record (EHR) system may be connected to an implanted cardiac monitor (like Abbott Confirm Rx) or a smart infusion pump (like Medtronic MiniMed) through Wi-Fi or 5G. In these situations, delays in deployment or disruptions brought on by licensing disputes may seriously jeopardize patient safety, transforming these disputes from business disputes to public health issues.

Wellness IoMT

includes consumer-grade gadgets like smart thermometers or fitness trackers (like Fitbit) that pair with smartphones via Bluetooth or Wi-Fi and then with cloud-based health apps. Although beneficial for managing one's own health, licensing disputes here have largely commercial repercussions that impact market outcomes and competition without immediately endangering patient safety.



The following table on Fig 1 showcases 12 examples of different Wellness IoMT and Life Critical IoMT to showcase distinction between the two:

Device Type	Example(s)	Category	Connectivity	Primary Function
Implantable Cardiac Defibrillator (ICD)	Medtronic Evera MRI, Abbott ICD	Life-Critical	Telemetry/Wi-Fi	Corrects life-threatening arrhythmias
Implantable Cardiac Monitor (ICM)	Abbott Confirm Rx	Life-Critical	Bluetooth/Wi-Fi	Long-term rhythm monitoring
Pacemakers (IoMT-enabled)	Medtronic Micra, Boston Scientific LUX-Dx	Life-Critical	Wi-Fi/Cellular	Regulates heart rhythms with remote monitoring
Smart Infusion Pump	Baxter Sigma Spectrum	Life-Critical	Wi-Fi	Automated drug delivery + dosage logging to EHR
Philips IntelliVue Patient Monitors	Philips IntelliVue MX750	Life-Critical	Wi-Fi/Ethernet	Continuous hospital bedside vitals monitoring
IoMT-powered Infant Warming Devices	Embrace Neo+ (India)	Life-Critical	Cellular/Wi-Fi	Maintains neonatal body temperature remotely
Wearable Fitness Trackers	Fitbit Inspire, Xiaomi Mi Band	Wellness/Non-Essential	Bluetooth/Wi-Fi	Step count, heart rate monitoring
Smart Thermometers	Withings Thermo, Kinsa Smart Thermometer	Wellness/Non-Essential	Wi-Fi/Bluetooth	Syncs temperature to app
Smartwatches with Health Features	Apple Watch, NoiseFit (India)	Wellness/Non-Essential	Bluetooth/Wi-Fi	Heart rate, ECG, SpO ₂ monitoring
Smart Rings	Oura Ring, Ultrahuman Ring (India)	Wellness/Non-Essential	Bluetooth	Tracks sleep, activity, stress
Smart Blood Pressure Monitors	Omron HeartGuide, Withings BPM	Wellness/Non-Essential	Bluetooth/Wi-Fi	Tracks blood pressure at home
Smart Scales	Withings Body+, HealthifyMe (India)	Wellness/Non-Essential	Bluetooth/Wi-Fi	Tracks weight & body composition

Fig.1: Wellness and Life Critical IoMT Examples



The impact of disputes involving life-critical IoMT must be evaluated in terms of both public health outcomes and financial implications. Under the "public interest" principle ingrained in both patent and competition law, this moral component supports the argument for regulatory action.

Therefore governance of SEPs through private FRAND commitments must evolve to not only focus on pure economic efficiency but also public interest objectives, most substantially in healthcare.⁶⁰⁹ For IoMT, this means reinterpreting contractual FRAND and not just as an instrument of contract law but as a tool of public policy that should never allow licensing regimes to render life-saving technologies inaccessible.⁶¹⁰ This implies how royalty regimes are designed to be much more transparent, with more muscle given to domestic competition agencies for enforcement, and the creation of a specific health-related SEP regime laying down the right to access healthcare. Without reforms, there is a significant risk that SEP-FRAND practices could hinder innovation and worsen inequalities, potentially limiting the promise of medical technology for emerging world economies.

INDIA'S SEP JURISPRUDENCE IN COMPARATIVE PERSPECTIVE

India's jurisprudence on SEPs and FRAND licensing has evolved largely through judicial decisions and competition law interventions rather than sector-specific statutes. While SEPs have long been central to telecommunications disputes, their implications for healthcare, especially in for IoMT is detrimental. Understanding India's jurisprudence requires situating it alongside developments in the European Union and the United States, both of which have grappled with similar tensions between patent rights, innovation incentives, and market access.

SEP-FRAND Under Indian Law

Under the Patents Act, 1970, patent holders have the exclusive right to prevent unauthorised use of their inventions, subject to limitations such as compulsory licensing in the public interest. Additionally, the Competition Act, 2002 prohibits *abuse of dominant position* (Section 4)⁶¹¹ and *anti-competitive agreements* (Section 3).⁶¹² Therefore, the idea of SEPs found at the intersection of these two regimes.

⁶⁰⁹ KEITH E. MASKUS, *PRIVATE RIGHTS AND PUBLIC PROBLEMS: THE GLOBAL ECONOMICS OF INTELLECTUAL PROPERTY IN THE 21ST CENTURY* 158 (Peterson Inst. for Int'l Econ. 2012).

⁶¹⁰ Alison Slade, *Repositioning the Access to Healthcare Debate: FRAND and the Internet of Medical Things* (Univ. of Leicester, Version 1, 2022), <https://hdl.handle.net/2381/19337555.v1>.

⁶¹¹ Competition Act, No. 12 of 2003, § 4 (India)

⁶¹² Competition Act, No. 12 of 2003, § 3 (India)



Indian courts first engaged extensively with SEP disputes in *Ericsson v. Micromax*⁶¹³ and *Ericsson v. Intex*.⁶¹⁴ In these cases Ericsson alleged that the defendants were using its SEPs covering GSM, EDGE, and 3G standards without licences. The defendants challenged Ericsson's royalty demands as excessive and discriminatory. The Delhi High Court granted interim injunctions in favour of Ericsson but also directed interim royalty payments pending a final FRAND determination. These cases foregrounded two key issues:

1. **Royalty base calculation:** Ericsson sought royalties based on the sale price of the end device, while implementers argued for a component-level base.
2. **Jurisdictional overlaps:** The Competition Commission of India (CCI) initiated these investigations and argued that Ericsson's licensing conduct constituted abuse of dominance. Ericsson challenged CCI's jurisdiction, arguing that patent disputes should be handled under the Patents Act alone.

The jurisdictional conflict culminated in *CCI v. Bharti Airtel Ltd.* (2018),⁶¹⁵ where the Supreme Court held that while the Patents Act governs patent grant and enforcement, the Competition Act applies “in addition to, and not in derogation of” other laws. This confirmed concurrent jurisdiction: the CCI can investigate SEP holders for anti-competitive conduct, even while patent infringement suits are pending before the courts.

Despite this, significant uncertainty remains. There is no codified methodology for determining what is “fair” or “reasonable” in royalty calculations. In a few CCI orders in SEP disputes, it is seen that watchdog has indicated support for using Smallest Saleable Patent-Practising Unit (SSPPU) approach, which limits the royalty base to the component implementing the patented technology, reducing the risk of inflated damages, though this is mainly done to conduct an investigation.⁶¹⁶ Courts, however, have leaned towards market comparable and, in recent cases, the Entire Market Value Rule (EMVR), using the full device price as the royalty base.

⁶¹³ *Micromax Informatics Ltd. v. Telefonaktiebolaget LM Ericsson* (Publ), Case No. 50/2013 (Competition Commission of India 2013)

⁶¹⁴ *Intex Techs. (India) Ltd. v. Telefonaktiebolaget LM Ericsson* (Publ), Case No. 76/2013 (Competition Commission of India 2013)

⁶¹⁵ *CCI v. Bharti Airtel Ltd.*, AIR 2019 SC 113, ¶ 29 (India).

⁶¹⁶ Sahithya Muralidharan, ‘Ericsson v. Micromax - A Kick-Start to SEP-FRAND Antitrust Jurisprudence in India’ (Wolters Kluwer, 13 July 2016) <<https://legalblogs.wolterskluwer.com/competition-blog/ericsson-v-micromax-a-kick-start-to-sep-frand-antitrust-jurisprudence-in-india/>> accessed 30 August 2025



In *Telefonaktiebolaget LM Ericsson v. CCI*, the Delhi High Court ruled in 2023 that the Patents Act supersedes the Competition Act with respect to a patentee's rights, thus nullifying the CCI's investigations.⁶¹⁷ The Supreme Court avoided a final settlement of the jurisdictional dispute in 2025 by dismissing the appeals as moot because of out-of-court settlements. This reaffirmation of precedent might make it possible to dismiss subsequent CCI investigations in a similar manner. Because of the resulting inconsistencies in India's legal system and the lack of effective regulatory oversight of SEP abuses, parties are choosing settlements over litigation in order to establish unambiguous precedents.⁶¹⁸

While India's SEP jurisprudence has been confined to the telecommunications sector, the underlying legal questions are directly transposable to IoMT. The same wireless standards that power smartphones also govern insulin pumps, cardiac monitors, and hospital telemetry systems. IoT disputes in consumer electronics provide an instructive comparison, though healthcare introduces additional ethical and rights-based stakes. What remains missing, however, is judicial sensitivity to the distinct ethical stakes: where royalty stacking in smartphones raises competition issues, royalty stacking in IoMT can mean exclusion from life-saving care.

European Union

The European Union has developed a relatively structured procedural framework for SEP disputes, particularly following the Court of Justice of the EU (CJEU) decision in *Huawei Technologies Co. Ltd. v. ZTE Corp.* (C-170/13, 2015).⁶¹⁹ The CJEU held that seeking an injunction on an SEP can constitute an abuse of dominance under Article 102 TFEU unless the SEP holder follows a specific negotiation protocol:⁶²⁰

1. Notify the alleged infringer of the infringement.
2. Make a written FRAND offer specifying terms.

⁶¹⁷ Danish Khan and Aakrit Aditya Sharma, 'Competition Commission of India's Jurisdiction Across All Sectoral Boundaries' (SCC, 20 September 2024) <<https://www.scconline.com/blog/post/2024/09/20/competition-commission-of-india-jurisdiction-across-all-sectoral-boundaries/>> accessed 2 September 2025

⁶¹⁸ 'Supreme Court has upheld the Delhi High Court's decision to quash the investigations initiated by the CCI under the Competition Act' (Online Legal India, 8 September 2025) <<https://www.onlinelegalindia.com/news/supreme-court-has-upheld-the-delhi-high-court-s-decision-to-quash-the-investigations-initiated-by-the-cci-under-the-competition-act/>> accessed 10 September 2025

⁶¹⁹ *Huawei Techs. Co. v. ZTE Corp.*, Case C-170/13, ECLI:EU:C:2015:477 (July 16, 2015)

⁶²⁰ Consolidated Version of the Treaty on the Functioning of the European Union art. 102, Oct. 26, 2012, 2012 O.J. (C 326) 47



3. Allow the implementer to respond with a counteroffer.

If these steps are not followed, the SEP holder risks violating EU competition law. This framework has been influential in balancing SEP enforcement with market access, providing more procedural clarity than India's current approach.

Royalty determination in the EU remains decentralised, with national courts adopting differing methodologies. Some, like Germany's regional courts, often adopt a willing licensor–willing licensee framework based on comparable licences, while others show openness to SSPPU-based valuations. Importantly, EU competition law explicitly constrains SEP enforcement behaviours, and the European Commission has proposed a regulation on SEPs in 2023 to increase transparency via a public SEP register and essentiality checks.

United States

In the United States, FRAND obligations are largely contractual, arising from commitments to Standard Setting Organisations (SSOs) such as IEEE or ETSI. Enforcement typically occurs through breach of contract or patent law claims rather than competition law.

US courts have generally avoided rigid formulas for royalty calculation, but decisions such as *Microsoft Corp. v. Motorola, Inc.* (2013),⁶²¹ emphasise evidence of comparable licences and the need to avoid royalty stacking. The SSPPU approach is widely favoured to prevent inflated awards, as seen in *LaserDynamics, Inc. v. Quanta Computer, Inc.* (2012).⁶²² Injunctions against willing licensees are rare following *eBay Inc. v. MercExchange, L.L.C.* (2006),⁶²³ which imposed a four-factor test for equitable relief. Unlike the EU, the US lacks a procedural code for SEP–FRAND negotiations, relying instead on case-specific equity considerations. This can lead to greater flexibility but also unpredictability.

IMPACT OF CURRENT SEP LICENSING PRACTICES ON IOMT

The Internet of Medical Things encompasses connected medical devices, wearables, implantable, and hospital systems that rely on standardised communication protocols such as Bluetooth Low Energy, Wi-Fi, 4G/5G, HL7, FHIR etc. These protocols are often covered by SEPs held by large multinational corporations. An example of this can be seen with devices such as the Abbott FreeStyle Libre 3. The

⁶²¹ *Microsoft Corp. v. Motorola, Inc.*, 795 F.3d 1024 (9th Cir. 2015).

⁶²² *LaserDynamics, Inc. v. Quanta Computer, Inc.*, 694 F.3d 51 (Fed. Cir. 2012).

⁶²³ *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388 (2006)



recent edition of this device uses Bluetooth, which would help the patients get immediate feedback on their glucose levels.⁶²⁴ For such a device to use this function it needs to license the Bluetooth standard. If any issues such as the one with the Apple watch in the case of Masimo were to happen in this case,⁶²⁵ such a function would be stalled and would not provide the revolutionary feature access that is needed for many patients.

Economic and Operational Barriers

1. **Royalty Stacking** – IoMT devices typically implement multiple standards simultaneously. A single wearable ECG monitor, for example, may require licences for wireless communication, encryption, and data interoperability standards. Each may involve separate SEP owners, resulting in cumulative royalties that significantly raise production costs. In a price-sensitive market like India, this can push devices out of reach for public hospitals and rural clinics.
2. **Opaque Licensing Terms** – Confidentiality clauses in SEP agreements obscure royalty benchmarks. Without visibility into what constitutes “reasonable” in practice, Indian IoMT start-ups are disadvantaged in negotiations, often accepting unfavourable terms to avoid litigation.
3. **Litigation Threats and Injunction Risk** – Even the threat of an injunction can deter adoption of SEP-covered standards in medical devices. Hospitals may avoid procuring innovative devices for fear of supply disruption, while small manufacturers may abandon development rather than face the expense of defending infringement claims.

Public Health Implications

In consumer electronics, SEP licensing disputes may slow product launches; in healthcare, delays or increased costs can directly impact patient outcomes. Restrictive licensing can:

- Reduce availability of affordable diagnostic tools in rural areas.

⁶²⁴ Abbott Launches Revolutionary Freestyle® Libre System In India, Providing Real-Time Continuous Glucose Monitoring For People With Diabetes (Abbott) <<https://www.abbott.in/media-center/press-releases/freestyle-libre-system-in-india-providing-real-time-continuous-glucose-monitoring-for-people-with-diabetes.html>> accessed 10 September 2025

⁶²⁵ ‘Apple Watch to lose feature after US court reinstates sales ban over patent dispute’ (Sky News, 18 January 2024) <<https://news.sky.com/story/apple-watch-to-lose-feature-after-us-court-reinstates-sales-ban-over-patent-dispute-13050692>> accessed 10 September 2025



- Limit competition by excluding small domestic innovators.
- Delay deployment of advanced telemedicine platforms reliant on high-bandwidth standards.

The absence of a sector-specific SEP policy in India means that FRAND terms are interpreted purely through commercial norms. As stated by Alison Slade, importing a consumer-electronics-oriented FRAND model into healthcare risks “life-and-death consequences” when interoperability standards are locked behind aggressive licensing regimes.⁶²⁶

Comparative Lessons for IoMT

From the EU:

- Procedural safeguards, like *Huawei/ZTE*’s negotiation protocol, could prevent abrupt supply disruptions in healthcare by ensuring good-faith engagement before injunctions.
- Transparency initiatives, such as proposed EU SEP registers, would give IoMT implementers visibility on essentiality and royalty rates.

From the US:

- Judicial restraint on injunctions, combined with SSPPU-based royalty assessments, offers a model for containing licensing costs while respecting patent rights.

Strategic Risks for India

If current SEP licensing practices persist without adaptation for healthcare:

1. **Innovation Drain** – Domestic IoMT firms may be deterred from developing standard-compliant devices, opting for proprietary, non-interoperable solutions with reduced utility.
2. **Foreign Dependency** – Reliance on foreign SEP holders could deepen, limiting India’s ability to shape future health-tech standards.
3. **Access Inequality** – High licensing costs could confine advanced IoMT tools to private hospitals, widening the gap between urban and rural healthcare.

⁶²⁶ Alison Slade, *Repositioning the Access to Healthcare Debate: FRAND and the Internet of Medical Things* (Univ. of Leicester, Version 1, 2022), <https://hdl.handle.net/2381/19337555.v1>.



Recommendations for Policy and Legal Reform in India

As the Internet of Medical Things is developing into a critical aspect of public health infrastructure, India appears to stand at a decisive crossroads. On one hand IoMT gives rise to opportunities to bridge increasing accessibility to medical technologies. On the other, embedding Standard Essential Patents into these very medical technologies raises urgent concerns vis-à-vis access, affordability, and regulatory preparedness. The Fair, Reasonable, and Non-Discriminatory licensing framework, which was initially designed to prevent abuses in the ICT and telecom sectors, is increasingly being tested when applied to sectors of deep ethical and public interest issues such as healthcare. The succeeding recommendations chart a course for India to consider as it attempts to resolve this tension through well-thought-out legal and policy reforms.

Developing Sector-Specific Regulation for SEPs in Healthcare and Medical Technology

Currently, India does not have a specific legal framework addressing specific challenges arising in enforcement of SEPs in the healthcare domain. While the Patents Act of 1970 and the Competition Act of 2002 provide some remedies, they seem limited, often reactive, and not preventive in nature. They also lack the granularity to deal with highly technical SEP disputes, especially those involving complex IoMT devices that may be protected by multiple SEPs covering wireless communication, data encryption, device interoperability, and real-time feedback mechanisms.

One reform option could be the development of sector-specific regulatory guidance, or even a model licensing framework, for SEPs in medical technologies. Such guidance could be co-designed by the Department for Promotion of Industry and Internal Trade, the Ministry of Electronics and Information Technology, and the Ministry of Health and Family Welfare. While patent law in India and under TRIPS is generally technology-neutral, and any carve-out for healthcare may face legal hurdles under provisions like Article 27, non-binding guidelines can still shape practice without conflicting with existing law. These could adapt international best practices, such as structured FRAND negotiation protocols, to the realities of health devices. In this context, the framework may: **Acknowledge** that medical and assistive devices function as public goods, particularly when deployed through government healthcare schemes such as Ayushman Bharat, and therefore require licensing terms that prioritize access and affordability,



- Allow compulsory, non-exclusive SEP licenses of limited duration during declared health emergencies, consistent with Section 84 of the Patents Act and TRIPS Article 31 safeguards on remuneration and scope, and
- Explore mechanisms like royalty caps or fixed royalty structures to guard against price inflation for SEPs tied to critical health infrastructure.

Such an approach would balance innovation incentives with public health needs, while acknowledging that further study and pilot frameworks may be needed before moving toward binding regulation.

Promoting Transparency and Accountability in FRAND Licensing for Life-Saving Technologies

In India, one proposal to improve transparency would be the creation of a registry for FRAND declarations, similar to initiatives being considered in the EU. Such a registry could, in the long term, be made compulsory for holders of SEPs, especially those covering health-critical standards, if they wish to enforce their rights in India. Patent holders could be required to:

- Disclose all licensing rates and terms publicly, including adherence to non-discriminatory practices (this would require cooperation among ministries),
- Disclose licensing arrangements involving India to relevant third parties (which would need statutory backing), and
- Publish an impact statement on whether their licensing practices affect access to healthcare in low-income areas (feasible only with multi-stakeholder oversight).

This database could be maintained by a body such as the Competition Commission of India or a specialized cell within the Indian Patent Office, with input from health regulators, technical experts, and civil society. While ambitious, such proposals would align India with emerging global practices on SEP transparency and could gradually be piloted to test feasibility.

Incentivising Innovation without Compromising Access

One of the major policy challenges India faces in supporting its domestic IoMT innovation ecosystem while at the same time making healthcare technologies accessible and affordable. On one hand, Indian startups and R&D institutions need protection and some return on investment to stay innovating. On the other, the unchecked assertion of SEP rights, especially by foreign patent holders, can lock out innovation and inflate the cost of healthcare technology which India has opposed for years.



To balance these objectives, a range of innovation-sensitive yet access-driven interventions should be considered:

- Promote patent pooling and open licensing for medical technologies built on SEP-covered standards. Drawing from patent pools in high-tech sectors like Bluetooth and MPEG⁶²⁷, as well as the Medicines Patent Pool's achievements⁶²⁸ in public health, pooling health-related SEPs could streamline licensing by pre-negotiating FRAND terms and offering a single point of access to essential patents. This would lower transaction costs, ease the burden on start-ups navigating fragmented IP landscapes, and enhance interoperability within the IoMT ecosystem. Although still a conceptual proposal, it presents a pragmatic way to balance innovation incentives with public health needs and deserves closer study.
- Affordability remains a key barrier to IoMT adoption in India, particularly for low-income and rural populations.⁶²⁹ A dual strategy can address this: first, allow differential royalties (tiered pricing), where technologies are licensed at lower rates in low-income markets, a practice shown to expand access while remaining commercially viable.⁶³⁰ This approach is consistent with FRAND's "non-discriminatory" clause, which permits distinctions between dissimilarly situated licensees. Second, introduce targeted subsidies for licensees serving rural healthcare markets, modeled on the U.S. FCC's Rural Health Care Program that provides a 65% discount on telecom and broadband services for telemedicine.⁶³¹ Together, tiered pricing and public subsidies can reduce costs, expand access, and accelerate IoMT diffusion in underserved regions.

⁶²⁷ Bao Tran, 'The Role of Patent Pools in Accelerating Deep Tech Development' (Patent PC, 12 September 2025) <<https://patentpc.com/blog/the-role-of-patent-pools-in-accelerating-deep-tech-development>> accessed 15 September 2025

⁶²⁸ Esteban Burrone et al, 'Patent Pooling to Increase Access to Essential Medicines' (2019) 97(8) Bulletin of the World Health Organization 575 <<https://pmc.ncbi.nlm.nih.gov/articles/PMC6653814/>> accessed 15 August 2025.

⁶²⁹ Peter Smith et al, 'Value-based tiered pricing for universal health coverage' (2023) Gates Open Research 4-16 <<https://gatesopenresearch.org/articles/4-16>> accessed 22 August 2025.

⁶³⁰ T. S. K. Sundararaman, 'A critical analysis of tiered pricing to improve access to medicines in developing countries' <<https://pmc.ncbi.nlm.nih.gov/articles/PMC3214768/>> accessed 22 August 2025.

⁶³¹ Federal Communications Commission, 'Rural Health Care Program' <<https://www.fcc.gov/general/rural-health-care-program>> accessed 22 August 2025.



- Open-source IoMT solutions can reduce India's dependence on foreign-held SEPs while lowering costs and spurring innovation.⁶³² Past successes like CSIR's Open-Source Drug Discovery project⁶³³ show the government's capacity to support collaborative, IP-free R&D. Existing programs such as Startup India's fee rebates⁶³⁴ and DCGI's fast-track approvals⁶³⁵ can be extended to IoMT, creating a low-cost, rapid pathway for domestic innovators. Leveraging these frameworks offers a practical route to strengthen India's self-reliance in healthcare technology.

Doing the above would decrease India's dependence on foreign SEPs. In turn this would increase the development of a self-sufficient and internationally competitive domestic IoMT sector in India

CONCLUSION

IoMT promises to provide healthcare access at all levels, whether in rural or urban areas, with precision diagnostics, mobile monitoring, and data-driven treatment. However, a SEP-FRAND regime could potentially jeopardize the fullest realization of that promise. There are serious risks when a system like this is introduced into the healthcare industry from the commercial technology sectors without being modified to meet moral, financial, and humanitarian requirements. Furthermore, it faces two threats in the absence of proactive reforms: an increase in the disparity in access to life-saving interventions in India and a reliance on foreign SEP holders for technological support. Therefore, a rethinking of an alternative strategy is needed. Technology protection and the constitutional right to health must be balanced. IP governance can be in line with India's public health goals through sector-specific regulations for medical SEPs, strict transparency requirements, and incentive programs focused on access-based innovation. By adopting global best practices and then customizing them for Indian realities we thereby avoid the importation of negative precedents of other jurisdictions, India

⁶³² Gerrit Niezen, Parisa Eslambolchilar and Harold Thimbleby, 'Open-source hardware for medical devices' (2016) 2 BMJ Innovations bmjinnov-2015-000080 <https://www.researchgate.net/publication/298328652_Open-source_hardware_for_medical_devices> accessed 22 August 2025.

⁶³³ Embassy of India, Moscow, '*India's Global Initiative on Open Source Drug Discovery*' <<https://www.indianembassy-moscow.gov.in/indias-global-initiative-on-open-source-drug-discovery.php>> accessed 22 August 2025

⁶³⁴ Startup India <<https://www.startupindia.gov.in/>> accessed 22 August 2025.

⁶³⁵ Abhijeet Singh, 'Fast-Tracking mechanism for approvals exists, efforts on to streamline trial reviews: DCGI' (Economic Times, 21 August 2025) <https://pharma.economictimes.indiatimes.com/news/policy-and-regulations/indias-dcgi-establishes-fast-track-drug-approval-system-what-you-need-to-know/123416538> accessed 22 August 2025.



will be setting a very strong precedent for an SEP-FRAND framework which is to the advantage of both inventors and patients. Without such reforms, India may risk increased reliance on foreign SEP owners and intensify healthcare inequalities. Considering India here, the "fair" and "reasonable" in FRAND must be interpreted not from commercial parity alone but also human dignity. Only then will SEPs for IoMT really become instruments of inclusion rather than exclusion. *Exclusive patents should never mean excluding patients.*



CHAPTER 20

REASSESSING PATENT POOLS: ANTITRUST RISKS IN PLATFORM-BASED LICENSING OF STANDARD-ESSENTIAL PATENTS

- Harsimran Kaur Batra *

ABSTRACT

The rapid expansion of connected technologies particularly in the automotive and Internet of Things sectors has increased reliance on Standard-Essential Patents (SEPs) licensed through platform-based patent pools such as Avanci. While such patent pools promise efficient access to critical wireless standards like 4G and 5G, increasing legal and policy scrutiny has raised concerns about their compatibility with modern competition law frameworks. This paper critically examines the antitrust implications of SEP licensing under the Avanci platform model, focusing on three interrelated concerns: collective dominance, disproportionate royalty rates, and the foreclosure of upstream component manufacturers. These risks were highlighted in the Continental v. Avanci litigation, policy reviews by the U.S. Department of Justice, the European Commission's Directorate-General for Competition (DG COMP), and Chinese regulators, and emerging data indicating that platform-based licensing structures impose elevated costs on downstream markets. Through a comparative legal analysis of antitrust enforcement in the United States, European Union and China, the paper evaluates whether platform-based SEP licensing pools can be reconciled with Fair, Reasonable, And Non-Discriminatory (FRAND) commitments and global competition norms. This analysis combines comparative legal review with structural assessment of Avanci's licensing framework and royalty allocation model. With integrating insights from regulatory practice, industrial economics and standard-setting organization, the paper argues that without targeted structural reform, platform style SEP pools risk violating core antitrust norms.

KEYWORDS: Patent pool, collective dominance, Avanci, FRAND commitment, Antitrust Law

INTRODUCTION

As we rapidly move into the era of digitalization and Industry 4.0 where smart technologies are increasingly interconnecting the physical, digital, and biological worlds and driving systematic changes across all

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disciplines,⁶³⁶ to enhance efficiency and quality of life the role of patents underlying these technologies is becoming ever more significant. The rapid emergence of connected technologies, especially in the automotive and Internet of Things (IoT) sectors, has significantly increased reliance on Standard-Essential Patents (SEPs).⁶³⁷ As wireless communication standards like 4G and 5G become foundational for enabling connectivity in devices ranging from smart cars to industrial sensors, the importance of SEPs continues to grow. To facilitate access to these essential patents and avoid resource-intensive licensing negotiations with dozens of different patent owners, patent pools have emerged as an effective licensing mechanism. In particular, platform-style pools like Avanci offer bundled SEP licenses covering standards such as LTE and 5G, making it easier for product manufacturers to navigate complex multi-party licensing.⁶³⁸

This paper critically examines the antitrust risks of such SEP licensing models, focusing on three interrelated concerns: collective dominance, disproportionate royalty rates, and foreclosure of upstream component markets. Early inquiries, including the *Continental v. Avanci* litigation⁶³⁹ and scrutiny from the U.S. DOJ, European Commission's Directorate-General for Competition (DG COMP), and China's State Administration for Market Regulation (SAMR), reflect growing regulatory unease.

Through a comparative analysis of competition law frameworks and enforcement approaches in the United States, European Union, and China including key cases such as *Microsoft v. Motorola*, *Huawei v. ZTE*, and the Qualcomm investigations, as well as regulatory actions involving Avanci this paper identifies discrepancies between regulatory outcomes and the principles of FRAND (Fair, Reasonable, and Non-Discriminatory) commitments. By examining these gaps, alongside a structural review of Avanci's licensing model, the paper argues that, without targeted reform, platform-based pools risk violating core antitrust principles. It further explores whether such platform pools can align with global FRAND (Fair, Reasonable, and Non-Discriminatory) licensing obligations and competition law frameworks.

This paper adopts a comparative legal analysis methodology to examine how competition law frameworks and enforcement practices address platform-based SEP licensing in the United States, European Union, and China. It analyses regulatory decisions, policy guidance, and judicial rulings using *Continental v. Avanci* litigation as a central case study, supplemented by comparative reference to cases such as *Microsoft v. Motorola* (U.S.), *Huawei v. ZTE* (E.U.), and the Qualcomm investigations (China).

STANDARD-ESSENTIAL PATENTS (SEPS) AND PATENT POOLS

⁶³⁶ Klaus Schwab, *The Fourth Industrial Revolution* (2016).

⁶³⁷ Yanis Luca Gamarra, *Patent Pools to Facilitate Technology Licensing in the Internet of Things* (Mar. 5, 2024), available at SSRN, <https://ssrn.com/abstract=4738162>.

⁶³⁸ Avanci, *About Avanci* (last visited Aug. 8, 2025), <https://www.avanci.com/about/>.

⁶³⁹ *Continental Automotive Sys., Inc. v. Avanci, LLC*, 27 F.4th 326 (5th Cir. 2022).



“A standard essential patent (SEP) is a patent that protects an invention essential to the implementation of a particular technology standard.” These standards are developed and established by Standardization Organizations also called Standard Setting Organizations (SSOs), which coordinate industry consensus around protocols like 4G, 5G, Wi-Fi, etc.⁶⁴⁰ Unlike non-essential patents, standard-essential patents (SEPs) cannot be circumvented, as their use is indispensable for complying with a given technical standard, making them unavoidable for any manufacturer seeking to produce standard-compliant products.⁶⁴¹

Due to the complexity of licensing SEPs individually, rights holders often aggregate their technologies into collaborative licensing arrangements, where multiple SEP holders offer a joint license through a single administrator or patent pool. Patent pools are commonly defined as an agreement between two or more patent owners to license one or more of their patents jointly, either to one another or to third parties. This involves aggregation of complex technologies that require complementary patents to provide an efficient and unified technical solution.⁶⁴² The principal advantage of such pooling lies in fostering innovation by reducing litigation and transaction costs of dealing with each individual patent, and simplifying access to essential technologies through bundled licensing.⁶⁴³

However, this cooperative structure can also raise concerns notably under antitrust law. These include the exclusion of upstream suppliers, disproportionate royalty rates, and the potential for collective dominance by pool participants.⁶⁴⁴ Such arrangements may suppress competition by enabling collusive behaviour, creating barriers to market entry, or disadvantaging firms outside the pool. These concerns have become increasingly clear in recent years through real-world licensing platforms.

A further and well-documented concern is patent hold-up, which arises when a standard includes patented technology owned by a participant in the standard-setting process. Once the standard becomes widely established, switching to alternative technologies may be prohibitively expensive or difficult. In this context, SEP holders may gain market power and exploit their position by demanding royalties far higher than would have been possible prior to standardization, or by seeking to exclude competitors from the market. Such conduct may deter implementers from adopting standardized technologies or lead to inefficient investments in developing and implementing a standard, while consumers ultimately bear the burden through unwarranted higher royalties and higher end-product prices.⁶⁴⁵

⁶⁴⁰ Secretariat, WIPO, Standard Essential Patents, WIPO, <https://www.wipo.int/web/patents/topics/sep>

⁶⁴¹ Gamarra, Patent Pools, *supra* note 2.

⁶⁴² World Intellectual Property Organization (WIPO), Patent Pools and Antitrust – A Comparative Analysis (Mar. 2014).

⁶⁴³ *Id.* at 9.

⁶⁴⁴ Victor Rodriguez, Patent Pools: Intellectual Property Rights and Competition (2010).

⁶⁴⁵ U.S. Dep’t of Justice & U.S. Patent & Trademark Off., Policy Statement on Remedies for Standards-Essential Patents Subject to Voluntary F/RAND Commitments (Jan. 8, 2013).



A prominent example is the Avanci platform. Unlike traditional patent pools that license at multiple levels, Avanci licenses exclusively to end-product manufacturers primarily automotive original equipment manufacturers (OEMs)—while excluding upstream component suppliers, such as module or chipset manufacturers. This licensing approach has triggered antitrust litigation, notably in *Continental Automotive Systems, Inc. v. Avanci, LLC*,⁶⁴⁶ and has drawn attention from authorities including the U.S. Department of Justice (DOJ), the European Commission’s Directorate-General for Competition (DG COMP), and China’s State Administration for Market Regulation (SAMR). Despite these growing concerns, global antitrust regulators have yet to establish a coherent structural framework for assessing the compatibility of platform-based SEP pools with competition norms highlighting the urgent need for a comparative legal analysis, as undertaken in this paper.

THE AVANCI LICENSING MODEL AND EMERGING ANTITRUST RISKS

As one of the most prominent SEP licensing platforms in the automotive and IoT sectors, Avanci has positioned itself as a solution to the growing complexity of accessing wireless technology through patent licensing. According to its website, “Avanci simplifies patent licensing by reducing complexity, increasing efficiency, and ensuring fairness for licensors and licensees.” It offers “one-stop” licenses for bundled 2G, 3G, 4G, and recently 5G SEPs under a fixed-fee model (e.g., flat-per-vehicle royalty model).

Collective Dominance

In *Continental Automotive Systems, Inc. v. Avanci, LLC*, the plaintiff alleged that several standard-essential patent holders, together with their licensing agent Avanci, unlawfully refused to license SEPs to the supplier on fair, reasonable, and non-discriminatory (“FRAND”) terms. This conduct was claimed to violate Sections 1 and 2 of the Sherman Antitrust Act of 1890 as well as associated state law. Section 2 of the Sherman Act makes it unlawful to “monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize.”⁶⁴⁷

A patent protects its holder not only from direct copying but also from independent invention of the same technology by others, thereby granting exclusive rights.⁶⁴⁸ Avanci brings together more than 130 licensors, including major SEP holders such as Nokia, Ericsson, Qualcomm, Intel, Samsung, Philips and Huawei. This consolidation of some of the most powerful SEP holders under a single platform significantly amplifies their collective market power, potentially enabling them to exert substantial control over licensing terms and suppress

⁶⁴⁶ *Continental Automotive Sys., Inc. v. Avanci, LLC*, 27 F.4th 326 (5th Cir. 2022).

⁶⁴⁷ 15 U.S.C. § 2 (2018).

⁶⁴⁸ 35 U.S.C. § 271(a) (2018); European Patent Convention art. 64, Oct. 5, 1973, 1065 U.N.T.S. 199; Patent Law of the People’s Republic of China, art. 11 (2020) (PRC).



competition. Such high level of concentration may reduce the ability of individual licensees to negotiate fair terms, facilitate coordinated pricing among licensors, and reduce competition by marginalizing smaller SEP holders.

Disproportionate Royalty Rates

A key concern involves whether Avanci's flat-per-vehicle royalty model results in disproportionate licensing costs for certain manufacturers. Avanci charges fixed fees for bundled SEP licenses across wireless generations—approximately \$9 per vehicle for 3G (including 2G and eCall), \$20 for 4G (including 2G, 3G, and eCall), and \$32 for 5G (including 2G, 3G, and 4G).⁶⁴⁹ This means manufacturers pay a uniform rate regardless of the actual number or extent of SEPs implemented in each vehicle. A requirement that licensees take multiple licenses together is sometimes referred to as “tying” in antitrust analysis. Under certain circumstances, tying arrangements can harm competition by coercing licensees to accept licenses they may not need.⁶⁵⁰ While most OEMs require a broad range of patents to ensure compliance, this one-size-fits-all pricing may disproportionately burden manufacturers with limited wireless functionality, raising concerns about proportionality and fairness under FRAND principles.

Article 102 of the Treaty on the Functioning of the European Union (TFEU) prohibits the abuse of a dominant position within the internal market or a substantial part of it, including pricing abuses, where such conduct may affect trade between Member States.⁶⁵¹ Major European automotive manufacturers such as Volkswagen, BMW, Mercedes-Benz, Renault, Volvo, Audi, Bentley, Rolls-Royce, and Porsche are among the licensees of Avanci. This means that Avanci's licensing policies and royalty structure directly affect a significant portion of the European automotive industry, raising the risk of excessive pricing and distorted competition.

Foreclosure of Upstream Component Manufacturers

Continental alleges that Patent-Holder and Avanci conspired to license exclusively ‘down the chain’ to OEMs, excluding upstream suppliers, demonstrating unreasonable restraint on trade. This allegedly violates Section 1 of the Sherman Act which prohibits every “contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce.”⁶⁵² The Avanci model operates under a “top-down” royalty approach, whereby the licensing obligations are enforced solely at the OEM level. Upstream suppliers are excluded from direct licensing, and OEMs are encouraged to secure all necessary rights through the platform.

⁶⁴⁹ Avanci, 4G Vehicle, Avanci, <https://www.avanci.com/vehicle/4gvehicle/> (last visited Aug. 8, 2025).

⁶⁵⁰ U.S. Dep’t of Justice & Fed. Trade Comm’n, Antitrust Guidelines for the Licensing of Intellectual Property § 5.5 (2017), available at <https://www.justice.gov/atr/IPguidelines/download>.

⁶⁵¹ Treaty on the Functioning of the European Union art. 102 (ex-Article 82 TEC).

⁶⁵² 15 U.S.C. § 1 (2018); Continental Automotive Systems, Inc. v. Avanci.



While the top-down methodology offers certain advantages by capping the cumulative royalty rate at a reasonable level, it remains difficult to determine what the aggregate royalty rate should be.⁶⁵³

By restricting licensing to large OEMs and imposing a flat, bundled per-vehicle royalty fee (approximately \$30 for the full 5G package), Avanci's model disproportionately burdens smaller upstream suppliers and emerging manufacturers. These entities often lack the scale or resources to absorb such fixed fees, effectively limiting their ability to compete or innovate within the wireless technology supply chain. This foreclosure of upstream manufacturers consolidates market power within a small group of dominant licensors and licensees, undermining the FRAND principles of fairness and non-discrimination.

The exclusion of upstream suppliers from direct licensing results in a structural bottleneck: without access to essential patents, upstream manufacturers are effectively barred from meaningful development and innovation. The absence of upstream supply innovation diminishes the emergence of new competitors, thereby reducing the diversity of technology providers available to downstream OEMs. Consequently, these licensees face a constrained market where they are compelled to negotiate exclusively with established licensors or the Avanci platform itself. This cyclical dynamic entrenches the market dominance of incumbent SEP holders, weakens competitive bargaining power, and perpetuates a closed licensing ecosystem that contravenes the fundamental objectives of FRAND commitments and antitrust principles aimed at market openness and innovation.

JURISDICTIONAL DIVERGENCE IN SEP ANTITRUST ENFORCEMENTS: U.S., EU, AND CHINA

The global regulation of standard-essential patent (SEP) licensing under antitrust law reflects a complex and evolving legal landscape, with key jurisdictions adopting divergent approaches based on differing legal philosophies and policy priorities. This section provides a comparative analysis of how the United States, European Union, and China regulate SEP licensing practices, particularly in the context of platform-based patent pools such as Avanci.

This analysis proceeds in three parts. First, it focuses specifically on how core principles of competition law are applied to the structure and operation of patent pools involving standard-essential patents (SEPs) in each jurisdiction. Second, it examines the positions taken by major regulatory authorities—namely, the U.S. Department of Justice (DOJ), the European Commission's Directorate-General for Competition (DG COMP), and China's State Administration for Market Regulation (SAMR)—with respect to enforcement actions related to SEP licensing and patent pools. Third, the section analyses one leading judicial decision from each jurisdiction—Microsoft Corp. v. Motorola Inc. (U.S.), Huawei v. ZTE (EU), and the Qualcomm investigations

⁶⁵³ Damien Geradin, SEP Licensing After Two Decades of Legal Wrangling: Some Issues Solved, Many Still to Address, TILEC Discussion Paper DP 2020-040 (Mar. 3, 2020), <https://ssrn.com/abstract=3547891>.



(China) to illustrate how courts and regulators have interpreted FRAND obligations and competitive harm in the context of SEP licensing platforms.

United States

U.S. federal antitrust enforcement agencies recognize a much closer and interconnected relationship between antitrust law and intellectual property rights, recognizing that the two are not inherently in conflict.⁶⁵⁴ As the Federal Circuit explained in *Atari Games Corp. v. Nintendo of America, Inc.*, "the aims and objectives of patent and antitrust laws may seem, at first glance, wholly at odds. However, the two bodies of law are complementary, as both are aimed at encouraging innovation, industry and competition."⁶⁵⁵ This philosophy is reflected in the U.S. Department of Justice (DOJ) and Federal Trade Commission (FTC) Antitrust Guidelines for the Licensing of Intellectual Property, which emphasize that patent pooling arrangements are "often procompetitive."

According to the Guidelines, pools can enhance market efficiency by clearing blocking positions, avoiding costly infringement litigation, integrating complementary technologies, and reducing transaction costs. However, the Guidelines also caution that cross-licensing and pooling arrangements may have anticompetitive effects in certain circumstances. For example, collective price or output restraints—such as joint marketing of pooled intellectual property rights combined with collective price setting or coordinated output restrictions—may be unlawful if they fail to contribute to an efficiency-enhancing integration of economic activity among the participants. Beyond pricing and licensing terms, another anticompetitive concern raised by pooling arrangements is their potential to deter innovation by enabling free-riding among members on the accomplishments of other pool members.⁶⁵⁶

Microsoft Corp. v. Motorola, Inc. provides a key judicial interpretation of FRAND licensing obligations in the context of SEPs. At issue in the appeal were two patent portfolios, formerly owned by Motorola, both subject to RAND agreements. The jury determined that Motorola had breached its RAND good faith and fair dealing obligations in its dealings with Microsoft. As Judge Berzon observed, "We live in an age in which the interconnectivity of a wide range of modern technological products is vital. To achieve that interconnection, patent-holders often join together in compacts requiring licensing certain patents on reasonable and non-discriminatory ('RAND') terms. Such contracts are subject to the common-law obligations of good faith and fair dealing."⁶⁵⁷

European Union

⁶⁵⁴ See IP Guidelines, *supra* note 15, § 1.0.

⁶⁵⁵ Sheila F. Anthony, *Antitrust and Intellectual Property Law: From Adversaries to Partners*, AIPLA Q.J. (May 5, 1999).

⁶⁵⁶ See IP Guidelines, *supra* note 15, § 5.5.

⁶⁵⁷ *Microsoft Corp. v. Motorola, Inc.*, 795 F.3d 1024 (9th Cir. 2015).



The European Commission's Directorate-General (DG) for Competition is responsible for formulating and enforcing EU competition rules, in cooperation with national competition authorities.

EU competition law, specifically Articles 101 and 102 of the Treaty on the Functioning of the European Union (TFEU), plays a crucial role in regulating the structure and conduct of patent pools.

- Article 101 of the treaty prohibits agreements between two or more independent market operators that may prevent, distort or restrict competition within the internal market. This includes practices such as price-fixing, market restriction or market sharing.
- Article 102 of the treaty prohibits the abuse of dominant market positions within the internal market or a substantial part of it, particularly where such conduct may affect trade between Member States. This includes unfair pricing, limiting production or unfair licensing conditions by SEP holders or patent pool administrators.⁶⁵⁸

Prior to *Huawei v. ZTE*, cases such as *Apple v. Motorola, Inc.* provided guidance on the compatibility of SEP litigation with competition law. These decisions provided a form of “safe harbor” for assessing when SEP holders may seek injunctions without abusing their dominant position and how FRAND obligations should be interpreted in that context.⁶⁵⁹

In *Huawei Technologies Co. v. ZTE Corp.*, Huawei Technologies Co. Ltd. sought an injunction and product recall against ZTE for alleged infringement of its SEPs related to telecommunications technology. The Court of Justice of the European Union (CJEU) addressed the circumstances under which a dominant SEP holder, having committed to license on Fair, Reasonable, and Non-Discriminatory (FRAND) terms may abuse its position under Article 102 TFEU (Treaty on the Functioning of the European Union) by initiating infringement proceedings against an alleged infringer.⁶⁶⁰

The court remarked that although the proprietor of the essential patent retains the right to seek a prohibitory injunction or product recall, the SEP status of the patent enables the proprietor to prevent competitors' products from entering or remaining on the market, thereby effectively reserving the manufacture of those products to itself. The CJEU emphasized the need to “strike a balance between maintaining free competition...and the requirement to safeguard [the SEP-holder's] intellectual property rights and its right to effective judicial protection.”⁶⁶¹

China

⁶⁵⁸ Treaty on the Functioning of the European Union arts. 101 (ex-Article 81 TEC), 102 (ex-Article 82 TEC).

⁶⁵⁹ Kyriakos Fountoukakos & Nick Root, *Huawei Technologies: More Certainty on SEP Injunctions, But Not the End of the Story*, CPI Antitrust Chronicles, Oct. 2015, Vol. 1, No. 2, at 5

⁶⁶⁰ *Huawei Technologies Co. Ltd. v. ZTE Corp.*, Case C-170/13, (CJEU, July 16, 2015).

⁶⁶¹ *Huawei Technologies Co. Ltd. v. ZTE Corp.*



China's National Intellectual Property Administration (CNIPA) in conjunction with other ministries issued the 'Guidelines for the Construction and Operation of Patent Pools'. According to Article 4 of the Guidelines, the construction and operation of patent pools shall follow the principles of: market orientation, balanced interests, openness, and non-discrimination. In China, the formation and operation of patent pools are governed by a combination of the Anti-Monopoly Law, the Anti-Monopoly Guidelines for the Intellectual Property Sector, and SEP-specific provisions. Under Article 15 of the CNIPA Guidelines, operators must ensure that pools do not restrict fair competition or harm industry development.⁶⁶²

China's antitrust watchdog, State Administration for Market Regulation (SAMR) issued the "Anti-Monopoly Guidelines for Standard-Essential Patents". These guidelines provide a clear framework for SEP licensing, promoting transparency and ensuring licensing practices comply with fair, reasonable and non-discriminatory (FRAND) committed. Articles 3 and 4 address the regulation of monopoly agreements and the abuse of market dominance involving Standard-Essential Patents (SEPs).⁶⁶³

- Article 3 covers specific situations where multiple patent holders may reach monopoly agreements during patent pooling and addresses situations where SEP holders may abuse patent rights to implement monopoly agreements.⁶⁶⁴
- Article 4 provides factors to consider when determining whether an operator has a dominant position in the relevant market. This includes licensing SEPs at unfairly high prices, refusing to license SEPs, tying SEPs with other products or services, imposing other unreasonable trading conditions involving SEPs, discriminatory treatment involving SEPs and abusing relief measures involving SEPs.⁶⁶⁵

In November 2013 PRC National Development and Reform Commission (NDRC), antimonopoly enforcement agencies which focuses on price-fixing investigations; commenced a formal antitrust investigation against Qualcomm to determine whether its licensing scheme was in breach of China's antitrust laws, particularly the Anti-Monopoly Law (AML) 2008.⁶⁶⁶ Under the AML, a business operator with a dominant market position is deemed to have abused such position if it: sells the relevant product in the relevant market

⁶⁶² China National Intellectual Property Administration et al., Guidelines for the Establishment and Operation of Patent Pools art. 4, art. 15 (May 13, 2025).

⁶⁶³ Li Mi, Overview of China's "Anti-Monopoly Guidelines for Standard Essential Patents," CPI Antitrust Chron. (Dec. 4, 2024), <https://www.lushenglawyers.com.cn/awards-press/overview-of-china-s-anti-monopoly-guidelines-for-standard-essential-patents/>.

⁶⁶⁴ Id.

⁶⁶⁵ Id.

⁶⁶⁶ Dechert LLP, A Case Study: How the Record-Breaking Antitrust Penalty Against Qualcomm Transforms the Landscape of SEPs Licensing in China (Mar. 27, 2015), <https://www.dechert.com/knowledge/onpoint/2015/3/a-case-study-how-the-record-breaking-antitrust-penalty-against.html>.



at unreasonably high price, refuses to trade with a party without legitimate reasons, bundles the sales of such product with other products and/or imposes unreasonable conditions for trading, etc.⁶⁶⁷

Qualcomm has been criticized for leveraging its extensive SEP portfolios to charge higher-than-normal royalty rates, provided on a “black-box” basis i.e., in a bundle with no information about the patents to the licensees. Qualcomm was found to run afoul of Article 17(1) and 17(5) of the AML by engaging in three types of conduct, i.e. charging unfairly high royalties, tying SEPs with non-SEPs and imposing unfair conditions on the sale of baseband chips.⁶⁶⁸ It was held that Qualcomm had abused its dominant market position and restricted competition, and that its monopolistic conduct had violated the PRC Anti-monopoly Law (AML).

FRAND COMMITMENTS AND IMPLEMENTATION

Standards promoting product interoperability are often collaboratively developed by market participants within the Standard Setting Organisations (SSOs). These standards are voluntary agreements containing technical specifications or other criteria aimed at serving the public interest by facilitating interoperability among complementary products and thereby promoting efficient resource allocation and production.⁶⁶⁹ FRAND which stands for fair, reasonable, and non-discriminatory, refers to a commitment obligating a patent holder to grant licenses to others on terms that are fair, reasonable, and non-discriminatory.

When patent holders include their protected technologies in a standard, they agree to license the relevant patents to implementers in line with the standard organization's intellectual property (IP) policy. This typically involves a pledge to license the patents either on a royalty-free basis or, more commonly, under Fair, Reasonable, and Non-Discriminatory (FRAND) terms.⁶⁷⁰ Licensing under FRAND terms seeks to strike a balance between SEP owners' interests in recouping research and development investments, on the one hand, and access to standardized technologies by implementers, on the other.⁶⁷¹

Currently there is no uniform consensus regarding the legal nature of FRAND commitment. In the United States and the United Kingdom, it is argued that FRAND has a contractual nature and therefore a breach of a FRAND commitment amounts to a breach of contract. On the other hand, German courts have so far refused to accept the contractual nature of FRAND, preferring instead to accommodate competition law defences of SEP implementers.⁶⁷²

⁶⁶⁷ Anti-Monopoly Law of the People's Republic of China, art. 17 (2007), translated in LawInfoChina, <https://www.lawinfochina.com/display.aspx?id=26893&lib=law>.

⁶⁶⁸ Susan Ning, Kate Peng & Lingbo Wei, NDRC's Qualcomm Decision: A Warning to Patent-heavy Companies, King & Wood Mallesons (Mar. 7, 2015), <https://www.chinalawinsight.com/2015/03/articles/compliance/ndrcs-qualcomm-decision%E4%BC%9Aa-warning-to-patent-heavy-companies/>.

⁶⁶⁹ DOJ & USPTO, Policy Statement (2013), *supra* note 10.

⁶⁷⁰ WIPO, Standard Essential Patents, *supra* note 5.

⁶⁷¹ *Id.*

⁶⁷² Geradin, SEP Licensing, *supra* note 18.



The Department of Justice and the U.S. Patent & Trademark Office have emphasized that participation in Standards Development Organizations (SDOs) is voluntary, and while patent holders may choose to make FRAND licensing commitments, once made, these commitments create enforceable obligations to license essential patents on fair, reasonable, and non-discriminatory terms. They also criticised imposing a “one-size-fits-all mandate for royalty-free or below-market licensing” which risks undermining both innovation incentives and the standardization process.⁶⁷³ This approach was echoed in the decision in *Microsoft v. Motorola*, where the court supported RAND terms that took into account the licensee’s circumstances and market realities, rather than imposing uniform rates.⁶⁷⁴ In contrast, platforms like Avanci adopt a fixed, one-size-fits-all royalty structure, offering the same rate regardless of the licensee’s scale or market position. While intended to promote transparency and efficiency, such rigid pricing may conflict with the underlying principles of FRAND by disproportionately burdening smaller manufacturers and limiting their competitive access to essential technologies.

Under the framework established by the Court of Justice of the European Union in *Huawei v. ZTE*, a SEP holder who has committed to licensing on FRAND terms may seek injunctive relief against a standard implementer after notifying the implementer of the infringement of the patent and submitting a FRAND licensing offer. The SEP holder may proceed with an injunction only if the implementer fails to comply with its own obligations by not responding to said offer with a FRAND counteroffer in a timely manner.⁶⁷⁵ In 2015, Chinese antitrust regulator, the National Development and Reform Commission (NDRC), fined Qualcomm Inc. \$975 million for abusing its dominant market position by charging unfairly high royalty fees and bundling unrelated licenses, practices that violated FRAND commitments.

POLICY RECOMMENDATIONS

Given the antitrust risks identified in platform-based SEP pools such as Avanci, and their potential misalignment with FRAND obligations, there is an urgent need for targeted structural reforms. These reforms should ensure that patent pools operate transparently, uphold competition norms, and maintain fair access to essential technologies.

Enhance Transparency In Royalty Allocation

One fundamental reform in standard-essential patent (SEP) licensing is the requirement for clear and transparent disclosure of how royalty fees are calculated and allocated among patent pool members. Such transparency would mean disclosure of itemized royalty rates tied to individual patents or licensors rather than

⁶⁷³ DOJ & USPTO, Policy Statement (2013), *supra* note 10.

⁶⁷⁴ *Microsoft Corp. v. Motorola, Inc.*

⁶⁷⁵ *Huawei Technologies Co. v. ZTE Corp.*



applying flat and bundled licensing fees. This would enable licensees to better understand the pricing structure and assess whether terms comply with FRAND commitments. As Sean Leach of Mathys & Squire notes, one key challenge in SEP licensing is the uncertainty as to the value of early-stage technology and its impact on royalty rates, not least because it makes the value and effectiveness of core intellectual property difficult to quantify.⁶⁷⁶ Heinz Goddar of Boehmert & Boehmert also has concerns over the lack of royalty-rate transparency in new markets, making it difficult to easily determine conditions for SEP/FRAND licensing.⁶⁷⁷

Flexible Royalty Models

The inclusion of non-essential patents in patent pools further complicates royalty allocation. As Bruce Hollibaugh of Strategic IP Initiatives observes, “some (non-essential patents) may be low quality or non-essential to the industry,” which can complicate licensing agreements and increase disputes by making it difficult for licensees to identify the true value and necessity of patents within the pool.⁶⁷⁸ Such complexities underscore the importance of flexible royalty models that can account for the varying quality and relevance of pooled patents. Instead of rigid one-size-fits-all fees, patent pools should adopt royalty models that reflect actual usage, product capabilities, and market circumstances of licensees, aligning better with FRAND principles.

Non-Discriminatory Access Across Supply Chains

To uphold the FRAND licensing principle of non-discrimination and to promote innovative and competitive environment, patent pools should ensure equal and fair access to licenses for all relevant players along the entire supply chain. This entails extending license to OEMs, component suppliers and upstream manufacturers. By doing so, patent pools prevent potential bottlenecks and barriers that could hinder innovation and creates a more competitive market. “I always compare patent pool strategies to card collections – the more cards you have, the better the exchanges you can make,” says Hector Chagoya of Consultora Mexstrategy.⁶⁷⁹ Similarly, having more patents or options within a pool fosters innovation and provides licensees with greater alternatives.

Preventing Collusion with Bilateral Agreements

Given the risk that pooling can facilitate tacit or explicit coordination among patent holders, antitrust authorities should actively monitor pool governance structures to ensure there is no coordinated setting of royalty rates or exclusionary practices and enforcement agencies must retain the authority to intervene promptly if pooling arrangements are found to restrict competition or harm downstream markets, using tools such as China’s “three

⁶⁷⁶ Sean Leach, quoted in Millie Ward, “No shortcuts: transparency and balancing needs critical for effective pool licensing,” IAM (Feb. 18, 2025), <https://www.iam-media.com/article/no-shortcuts-transparency-and-balancing-needs-critical-effective-pool-licensing>.

⁶⁷⁷ Id.

⁶⁷⁸ Id.

⁶⁷⁹ Leach, *supra* note 41.



letter one-notice” mechanism. The patent pools should allow for independent licensing outside of the Platform, which also lessens potential competitive concerns because licensors preserve their ability to compete with the pool license. Bilateral agreements involve direct licensing arrangements between two parties; it serve as an effective tool to prevent collusion among patent holders.

International Harmonization of SEP Antitrust Enforcement

Given the global nature of digital technologies and the widespread involvement of companies operating across multiple jurisdictions, regulatory agencies worldwide should collaborate closely to establish shared guidelines and enforcement practices concerning Standard Essential Patent (SEP) pools. The complexities introduced by globalization and the rise of Industry 4.0 technologies underscore the need for an international treaty or consensus framework that addresses the unique characteristics and global usage of SEPs. Such harmonization would reduce legal uncertainty for innovators and licensees, promote fairness, and foster a balanced and predictable global ecosystem for innovation and competition.

CONCLUSION

Despite rising concerns, regulatory responses to Avanci’s licensing model remain somewhat fragmented across jurisdictions. In the United States, the Department of Justice (DOJ) and Federal Trade Commission (FTC) view intellectual property rights and antitrust law as largely complementary and assume SEP pools are “often procompetitive.” The Department of Justice (DOJ) response to Avanci’s joint patent-licensing pool concluded that Avanci’s proposed 5G platform is unlikely to harm competition.⁶⁸⁰ In *Continental v. Avanci*, the Fifth Circuit upheld the district court’s decision to dismiss all of Continental’s claims for lack of standing. The court found that Continental did not suffer an antitrust injury and therefore lacked standing to bring the claims. The decision effectively marked a major win for Avanci by allowing it to choose its licensees rather than being forced to license every portion of a supply chain and such actions were deemed not to constitute antitrust violations.

In contrast, the EU applies a precautionary model—supporting SEP enforcement rights but intervening if abuse of dominance is evident. EU courts in cases such as *Huawei v. ZTE* recognize potential for antitrust concerns in SEP enforcement and injunction-seeking. Although the European Commission has not yet formally reviewed Avanci’s licensing model, the European Automobile Manufacturers’ Association (ACEA) — along with five leading automotive groups—sent a letter urging Avanci to provide greater transparency regarding the patents included in its 5G programme, in line with the principles outlined in the draft EU Regulation on Standard Essential Patent (SEP) licensing. The letter specifically questions how patent essentiality is assessed

⁶⁸⁰ Letter from Makan Delrahim, Assistant Att’y Gen., U.S. Dep’t of Just., Antitrust Div., to Mark H. Hamer, Baker & McKenzie LLP (July 28, 2020).



and how royalty rates are determined to meet FRAND (fair, reasonable, and non-discriminatory) standards.⁶⁸¹ ACEA represents 16 major Europe-based vehicle manufacturers, including BMW, Volkswagen, Stellantis, Mercedes-Benz, and Renault Group. In China, agencies such as the State Administration for Market Regulation (SAMR) and the National Development and Reform Commission (NDRC) have aggressively pursued SEP-related abuse of dominance, as seen in the Qualcomm investigation. SAMR issued a reminder to Avanci about potential monopoly risks associated with their licensing practices for automotive wireless communication SEPs, reflecting a more stringent regulatory position. Additionally, SAMR has developed a "Three Letters and One Notice" soft enforcement scheme, comprising four progressive steps: (1) a reminder and urging letter, (2) an interview and notification letter, (3) a notice of case initiation, and (4) an administrative penalty letter, aimed at addressing potential antitrust concerns through incremental engagement.⁶⁸²



⁶⁸¹ Automakers Urge 5G Patent Pool Avanci to Lead by Example in SEP Licensing, European Automobile Manufacturers' Association (ACEA), July 2024, <https://www.acea.auto/news/article/automakers-urge-5g-patent-pool-avanci-to-lead-by-example-in-sep-licensing>.

⁶⁸² Hannah C.L. Ha & Vincent W.C. Law, Mainland China's Evolving Antitrust Terrain (2024–Q1 2025) – Part 6 of 6 (2025), Meng Bo Law Office (contrib. Marine Zhou), JSM Legal Insights, <https://www.jsm.com/publications/2025/mainland-chinas-evolving-antitrust-terrain-2024-q1-2025-part-6-of-6>.



CHAPTER 21

BALANCING PATENT PROTECTION AND ACCESS TO MEDICINES: A COMPARATIVE ANALYSIS OF COMPULSORY LICENSING IN INDIA, BRAZIL, AND SOUTH AFRICA IN THE POST-TRIPS ERA

- Kavya Shree AP*

ABSTRACT

The international patent regime for pharmaceuticals has struggled for many years between balancing the need to encourage innovation and promoting fair access to essential medicines. This research paper critically analyzes the doctrine of compulsory licensing as a tool of law to manage this tension and how it has been applied in three large developing nations like India, Brazil, and South Africa under the TRIPS Agreement and ensuing WTO flexibilities. In a comparative legal study, the paper examines how each country has used compulsory licensing to tackle public health emergencies, including HIV/ AIDS and cancer, as well as push back against global pressure from pharma lobbies and trade partners. Pivotal case studies of Bayer v. Natco (India), Brazil's antiretroviral licenses, and South Africa's constitutional litigation of the AIDS crisis are examined to gauge the legal, economic, and political implications of such action. The paper argues that while compulsory licensing offers a legitimate mechanism for safeguarding public health, in practice, its implementation is frequently constrained by procedural barriers, geopolitical forces, and scarce local production capabilities. In assessing the success of these national approaches, the paper suggests an adjustment of global IP standards and promotes greater equity of the international pharmaceutical patent regime one that honors creativity but takes precedence of human rights and health equity in the Global South.

KEYWORDS: Compulsory Licensing, Patent Protection, TRIPS Agreement, Access to Medicines

INTRODUCTION

The international pharmaceutical patent regime works at the crossroads of two conflicting imperatives: the imperative to stimulate pharmaceutical innovation by offering exclusive rights and the ethical and legal imperative to provide access to lifesaving medicines, especially in low- and middle-income nations. Patents as intellectual property gives inventors a limited monopoly on their inventions. In the pharmaceutical industry,

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this means the privilege to dictate production, use, and sale of new medicines for a period generally lasting up to 20 years. Though the exclusivity is meant to compensate for innovation and recoup the huge investments in research and development (R&D), it usually leads to exorbitant drug prices that put life-saving medicines out of reach for millions, particularly in the Global South. This conflict of patent protection over public health emerged with the enforcement of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) under the auspices of the World Trade Organization (WTO). TRIPS harmonized IP standards globally, requiring member states to grant patent protection for pharmaceutical products and processes. Yet, it also included some flexibilities for states to treat public health emergencies. Perhaps the most important among these is the compulsory licensing provision in Article 31 of TRIPS, whereby a government can license the use of an invention patented without the approval of the owner of the patent, on certain conditions. The legal and ethical significance of this provision was reasserted by the Doha Declaration on the TRIPS Agreement and Public Health (2001), which elucidated that 'TRIPS must be interpreted in a way that is facilitating WTO members' entitlement to protect public health and ensure access to medicines for all'.⁶⁸³

In the context of this background, the current research paper provides a critical and comparative examination of how the doctrine of compulsory licensing has been utilized in three of the world's largest developing nations India, Brazil, and South Africa as a legal and policy instrument to counter public health imperatives. These jurisdictions not only suffered from great public health costs, such as the HIV/AIDS epidemic and increasing numbers of non-communicable diseases such as cancer but also have been outspoken in exercising their sovereign rights to trump patent monopolies where that is appropriate for public health. Every nation has gone about the application of TRIPS flexibilities through a distinct legal, political, and economic prism, thus being perfect case studies to assess the actual-world applicability of compulsory licensing as a system to strike a balance between innovation and equitable access. The aim of this study is to analyze the way these nations have understood and implemented compulsory licensing as a response to health crises, and to assess the legal, economic, and political efficacy of these measures. The research seeks to analyze whether compulsory licensing is a viable and equitable model of pharmaceutical regulation in the Global South or whether its applicability is limited by procedural, political, and infrastructural hurdles. The approach followed is doctrinal and comparative in nature. It entails a close reading of case law, statutes, and international treaties like the TRIPS Agreement and the Doha Declaration, supported by a close reading of judicial rulings, state policies, and administrative schemes of India, Brazil, and South Africa. The research utilizes case study analysis of historical examples of compulsory licensing like Bayer v. Natco in India, Brazil's Efavirenz license, and South African litigation during the AIDS epidemic to offer tangible reflections on how theory plays out in practice. This combination of

⁶⁸³ Agreement on Trade-Related Aspects of Intellectual Property Rights art. 31, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299.



methodological approaches permits a keen appreciation for the intersection between international IP norms and local legal systems in determining access to medicines.

THE TRIPS AGREEMENT AND THE LEGAL FRAMEWORK OF COMPULSORY LICENSING

The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), entering into force in 1995 under the aegis of the World Trade Organization (WTO), is a major milestone in international intellectual property rights regulation, including those on pharmaceutical products. TRIPS requires that all WTO member countries are to ensure minimum standards of protection in different categories of intellectual property, including patents, that are to be made available for any invention's product or process in any field of technology without distinction, under Article 27. In the pharmaceutical industry, this requirement was a shift for most developing nations, such as India and Brazil, that had exempted pharmaceutical products from patenting so that they could be kept affordable and foster local generic industries.⁶⁸⁴

Article 30 of TRIPS permits exceptions to exclusive rights provided by a patent to a limited extent, subject to the conditions that such exceptions must not unreasonably prejudice the normal exploitation of the patent and must not unreasonably prejudice the legitimate interests of the owner of the patent. Article 31 is, however, the pillar upon which rests the international legal foundation of compulsory licensing. This article allows member states to grant permission to use a patented invention without the right holder's agreement, under specified procedural and substantive conditions. These are, *inter alia*, the provision that authorization should be judged on its own merits, that the patent owner should be paid fair and adequate remuneration, and that good faith efforts to negotiate voluntary licenses be undertaken before such authorization, except where there is a case of national emergency or extreme urgency.

The specific lines and flexibility of Article 31 have been the subject of much politicking and debate, most notably with respect to its availability to developing nations in need of public health emergencies. To address growing international pressure and activism in the HIV/AIDS pandemic of the early 2000s, the WTO brought into force the Doha Declaration on the TRIPS Agreement and Public Health in 2001. This declaration was a strong reaffirmation of states' sovereign prerogatives to place public health above patent protection. It clearly referred to the fact that "every member has the right to grant compulsory licenses and the autonomy to decide the grounds upon which such licenses are issued," thus defying the trend, particularly of the developed nations and pharmaceutical lobbies, to argue that TRIPS limits national freedom in granting compulsory licenses. The Doha Declaration also stressed that TRIPS must not hinder members from pursuing actions to safeguard public

⁶⁸⁴ Paris Convention for the Protection of Industrial Property, Mar. 20, 1883, as revised at Stockholm, July 14, 1967, 21 U.S.T. 1583, 828 U.N.T.S. 305.



health and reaffirmed their right to utilize the flexibilities in the Agreement, particularly in the case of epidemics like HIV/AIDS, tuberculosis, and malaria.⁶⁸⁵

Yet, the Doha Declaration also pointed out a particular limitation of the TRIPS system: the fact that countries without adequate pharmaceutical production capacities cannot use compulsory licensing to import inexpensive drugs effectively. Such a concern resulted in the establishment of the Paragraph 6 mechanism in 2003, subsequently codified as a TRIPS Agreement amendment in Article 31bis. This mechanism enables governments to export pharmaceutical products produced under compulsory license to third countries where there is no such capacity to locally manufacture such drugs. Though a critical move toward making access operational in developing countries, the Paragraph 6 system has been faulted for being procedurally complicated, poorly utilized, and not necessarily addressing the challenges of LDCs in a major way. The most significant use of this mechanism was when Canada granted a compulsory license to ship antiretroviral medication to Rwanda in 2007, but the mechanism was so difficult to invoke that it has been invoked even less since. The WTO Dispute Settlement Body (DSB) interpretation of TRIPS-related cases involving compulsory licensing has been minimal so far. Despite various publicity-grabbing controversies concerning compulsory licensing and drug patents, including the United States' actions against Thailand and South Africa, few have reached formal adjudication in front of the DSB. This is perhaps due to the politically charged nature of public health conflicts and the possibility that WTO members would rather settle such conflicts diplomatically than through formal proceedings. However, the threat of dispute settlement has at times been used as leverage, discouraging nations from exercising their TRIPS flexibilities to the fullest, particularly when they are under pressure from more dominant trading partners, such as the United States employing the Special 301 Report and bilateral trade agreements to discourage compulsory licensing.

By and large, the TRIPS Agreement, despite creating a uniform structure of patent protection, has built into it mechanisms most importantly Articles 31 and 31bis that were supposed to provide member states with some flexibility to attend to overriding public health requirements. The Doha Declaration was a political and legal affirmation of these rights, but the practical application of compulsory licensing is still limited by procedural restrictions, geopolitical considerations, and lack of adequate technical capacity in much of the developing world. It is essential to grasp this intricate legal architecture to assess how countries such as India, Brazil, and South Africa have approached and interpreted these provisions within their domestic pharmaceutical policies, an issue investigated in the remaining sections of this paper.⁶⁸⁶

INDIA: A PRO-PUBLIC HEALTH INTERPRETATION

⁶⁸⁵ World Trade Organization, Declaration on the TRIPS Agreement and Public Health, WT/MIN(01)/DEC/2 (Nov. 14, 2001) [hereinafter Doha Declaration].

⁶⁸⁶ Convention on Biological Diversity, June 5, 1992, 1760 U.N.T.S. 79.



India's response to pharmaceutical patents and compulsory licensing has historically demonstrated a sensitive balancing of innovation incentives and public health considerations. Such a balance is inextricably embedded within the nation's historical, economic, and legal contexts. Prior to TRIPS, India had implemented a policy architecture that purposively narrowed the scope of pharmaceutical patents for purposes of making drugs affordable and ensuring self-reliance. The Patents Act of 1970, following the suggestions of the 1959 Ayyangar Committee Report, did not include product patents for drugs but permitted process patents for a limited time. This facilitated Indian generic makers to make cheaper forms of patented medicines through different processes, fueling the development of a strong domestic pharmaceutical sector with an emphasis on affordability and availability. This pro-public health position made India a global producer of low-cost generic drugs, especially for the developing world.⁶⁸⁷ India's joining of the World Trade Organization and the resulting requirement to abide by the TRIPS Agreement, however, necessitated dramatic legal reforms. While India only implemented product patent protection at the conclusion of the transition period in 2005, the Patents (Amendment) Act of 2005 finally harmonized Indian law with TRIPS. Nevertheless, the revised Act maintained key safeguards in the form of compulsory licensing provisions under Section 84, indicating India's ongoing commitment to preserving public access to critical medicines. Section 84 permits any party concerned to make an application for a compulsory license after three years from a patent grant, on various grounds such as failure of the reasonable needs of the public, unavailability of the patented invention at a reasonably acceptable price, and non-working of the patent in India.⁶⁸⁸

The most important test of this provision and the reaction of the global pharmaceutical industry to it was in the landmark case of *Bayer Corporation v. Natco Pharma Ltd.* in 2012. This was the first time that the Indian Patent Office had granted a compulsory license under the post-TRIPS regime. Bayer had the Indian patent for sorafenib tosylate, marketed as Nexavar, which was an anti-cancer drug used in late-stage kidney and liver cancer. The drug retailed at about ₹2.8 lakhs (USD 5,000) per month, making it not available for most Indian patients. Natco Pharma sought a compulsory license under Section 84 on the grounds that the drug was out of reach of most of the Indian population, was not locally produced, and was being retailed at an outrageous price.⁶⁸⁹ The Controller General of Patents, Designs and Trademarks issued the license, pointing out that Bayer had not been able to fulfill the reasonable needs of the public. It argued that only a minuscule proportion of eligible patients in India were covered by the drug and that the cost rendered it practically inaccessible. The ruling read "reasonably affordable price" against the background of Indian economic realities and unambiguously tied affordability to the needs of public health. The order also pointed out that Bayer had not effectively "worked" the patent in India under Section 83 of the Act, as it was importing the drug and not

⁶⁸⁷ International Covenant on Economic, Social and Cultural Rights, Dec. 16, 1966, 993 U.N.T.S. 3.

⁶⁸⁸ U.S. Trade Representative, 2024 Special 301 Report (Apr. 2024).

⁶⁸⁹ *Bayer Corp. v. Natco Pharma Ltd.*, (2012) IPAB 35 (India).



making it in the country. Natco was allowed to market the generic version for ₹8,800 a month a 97% drop in price and had to give a royalty of 6% of net sales to Bayer.

The Bayer v. Natco ruling touched off a wave of international reactions. While NGOs and public health activists welcomed India's emphasis on access over profit, multinational pharma corporations and trade organizations, especially in the United States and Europe, condemned the action as an attack on intellectual property rights and innovation. Bayer appealed the ruling, but it was affirmed by the Intellectual Property Appellate Board (IPAB) in the Controller's order, thereby upholding the public need and affordability concepts as pivotal to compulsory licensing orders. The Indian courts, from the Bombay High Court onward to the Supreme Court, refused to intervene in the findings, thus solidifying the public health basis embedded within India's patent law. Following Bayer v. Natco, a few other requests for compulsory licenses were made, but to no such success. Requests by Lee Pharma (for the anti-diabetic drug saxagliptin owned by AstraZeneca) and BDR Pharma (for the cancer drug dasatinib owned by Bristol-Myers Squibb) were denied by the Patent Office. These rejections emphasized a more conservative and rigorous approach in assessing the procedural requirements for compulsory licensing, specifically in relation to the efforts of the applicant in approaching the patent holder to obtain a voluntary license and in determining the existence of a substantial unmet public health need. There have been some analysts who understand this change to be a tactical move against growing international pressure and trade talks, including the United States placing India on its Priority Watch List in its Special 301 Report. Despite this, the Bayer v. Natco case continues to be the landmark case in international pharmaceutical patent jurisprudence. It showed how a developing nation was legally and effectively able to utilize TRIPS flexibilities to safeguard public health without infringing on international obligations. The case also established a precedent regarding the interpretation of such terms as "affordability," "reasonable demands of the public," and "working of a patent" in a way that is responsive to domestic socio-economic realities. In addition, it highlighted the need for a robust administrative and judicial system that facilitates the enforcement of public health measures in a TRIPS-consistent legal system.⁶⁹⁰ Overall, India's experiment with compulsory licensing is a forward-looking and principled understanding of TRIPS flexibilities in the interest of preserving access to life-saving medicines. Although the first boldness seen in Bayer v. Natco has not been matched in equal strength, the case is a model for other developing countries who wish to maneuver the nexus of IP rights and public health. The ongoing challenge is how to balance domestic and foreign pressures while maintaining the legal and moral high ground in putting human lives ahead of patent monopolies.

BRAZIL: STRATEGIC USE OF THREATS AND ACTUAL LICENSES

Brazil is an inspiring illustration of a developing nation with strong public health commitments, manufacturing capabilities, and potential for deploying the legal tool of compulsory licensing imaginatively and aggressively in

⁶⁹⁰ Novartis AG v. Union of India, (2013) 6 S.C.C. 1 (India).



promotion of national health interests. While most low- and middle-income nations depend largely on humanitarian appeals or donor-imposed programs to gain affordable access to drugs, Brazil opted for a more strategic, frequently preemptive tactic threatening compulsory licensing as leverage in price negotiations with multinational drug companies. This approach, rooted in political will and legal reforms, mirrors Brazil's attempt to balance its international IP commitments with its constitutional commitment to universal health coverage within the Sistema Único de Saúde (SUS), the national public health system.

Brazil's IP legal framework was reshaped in the mid-1990s to bring it into conformity with TRIPS obligations, resulting in the promulgation of Law No. 9.279/1996 informally referred to as the Brazilian Industrial Property Law. The law granted product patent protection to pharmaceuticals and other industries while continuing essential public interest protections. Articles 68 through 74 of the law contain compulsory licensing's statutory basis. Article 68 allows compulsory licensing when a patent is not worked sufficiently in Brazil, when there has been abuse of patent rights, or when there is a necessity to address national emergency or public interest requirements. Article 71 also gives the government the authority to grant a compulsory license *ex officio* during national emergency or public interest situations, without the need for prior negotiation with the owner of the patent.

The experience of Brazil with compulsory licensing can only be appreciated as it applies to its response to the HIV/AIDS epidemic, which devastated the nation during the 1990s and early 2000s. The government took a courageous policy step to make universal and free access to antiretroviral (ARV) therapy available under SUS, a step that put extraordinary budgetary pressure on the health budget from the high cost of patented ARVs. Instead of automatically resorting to compulsory licenses, Brazil tactically used the threat of issuing them to put pressure on multinationals to reduce prices. During 2001-2006, Brazil consistently employed this strategy in bargaining with giant pharma companies such as Merck, Abbott (AbbVie), and Roche and was able to get it through with significant discounts without threatening to use the compulsory licensing clause. These cases highlighted the effectiveness of the legal weapon as a bargaining chip and not as a litigation option.⁶⁹¹

But Brazil ultimately enforced its threat in 2007 by issuing a compulsory license for the medication Efavirenz, a critical ARV held under patent by Merck. The government of Brazil identified the outrageous price of the medication about US\$1.59 per pill as an impediment to continuing its policy of universal treatment. Following extended price discussions with Merck that did not yield a satisfactory result, the Minister of Health used powers under Article 71 of the Law on Industrial Property to issue a decree that stated a situation of public interest and approved the importation and local manufacturing of a generic form of Efavirenz. This action was Brazil's first and to this point, sole issuance of a compulsory license, and it sent a powerful signal both nationally and globally about the government's willingness to put public health ahead of private monopolies. In the aftermath

⁶⁹¹ *F. Hoffmann-La Roche Ltd. v. Cipla Ltd.*, 2008 (6) Bom. C.R. 404 (India).



of the license issuance, Brazil started importing an Indian generic version of Efavirenz while at the same time asking the public pharmaceutical agency, Fiocruz (Fundação Oswaldo Cruz), to produce locally. Having long played the pivotal role in a self-sustaining public health infrastructure in Brazil, Fiocruz was commissioned to ensure domestic self-sufficiency in the production of the drug, thus diminishing dependence on imported sources and amplifying its national pharmaceutical capacity. The strategy adopted by the government combined compulsory licensing with industrial policy, not only as a mechanism to source less expensive medicine but also as a mechanism for long-term technological development as well as a source of health care sovereignty.

The political economy of Brazil's licencing strategy demonstrates a complex balancing act between public health pressures and international diplomatic needs. On the one hand, the government projected its strong stand on the right to health, rooted in the constitutional guarantee and aided by vocal civil society mobilization. Conversely, it had to walk through the geopolitical minefield of trade reprisals, especially from the United States, which had already put Brazil on its Special 301 Priority Watch List. Nevertheless, Brazil cleverly stood its ground by pointing out that its measures were entirely in accordance with TRIPS and in consonance with the Doha Declaration's reaffirmation of members' right to protect public health.⁶⁹² The outcomes of the Efavirenz compulsory license offer valuable insights into the effectiveness and limitations of such measures. The Brazilian government reported savings of over US\$100 million in the years following the license and successfully maintained its universal ARV treatment program without budgetary strain. Moreover, the move strengthened Brazil's negotiating power in subsequent pricing discussions and reaffirmed its leadership among Global South countries in using TRIPS flexibilities. But the uniqueness of this case also highlights the complexities in invoking compulsory licensing, such as having proper administrative processes, political will, and local production capabilities. In the years since the Efavirenz case, Brazil has mostly returned to negotiation-style strategies, though the legal framework of compulsory licensing is still in place and still exerts a powerful threat in terms of price negotiations.⁶⁹³

In short, Brazil's experience is a sophisticated and assertive application of compulsory licensing both as a legal tool for drug access, but also as a geopolitical and economic instrument. By merging public health priorities and state industrial objectives with international law strategy, Brazil has hewn out a unique model showing how TRIPS flexibilities can be realized in terms both of form and content. Although their actual application has been uncommon, the strategic deployment of their threat has made an enormous difference in pharmaceutical pricing and access in Brazil, and it provides a model for other developing nations wanting to safeguard public health under the limits of international IP law.

⁶⁹² Lei No. 9.279, de 14 de Maio de 1996, Diário Oficial da União [D.O.U.] de 15.5.1996 (Braz.).

⁶⁹³ Decreto No. 6.108, de 4 de Maio de 2007, Diário Oficial da União [D.O.U.] de 7.5.2007 (Braz.).



SOUTH AFRICA: CONSTITUTIONAL DIMENSIONS AND LITIGATION-DRIVEN REFORM

South Africa's experience with compulsory licensing and pharmaceutical patent law cannot be comprehended without examining the profound historical, political, and socio-economic context defined by its apartheid heritage and the devastating HIV/AIDS pandemic of the 1990s and early 2000s. Millions of South Africans died at the peak of the epidemic because they did not have access to antiretroviral (ARV) medication, which was exorbitantly priced by multinational pharmaceutical corporations. In this context, public health activism, legal change, and constitutional adjudication came together to test the limits of patent enforcement to the right to life and health.⁶⁹⁴

The underlying law that regulates medicines in South Africa is the Medicines and Related Substances Control Act, 1965, as amended. This law permits practices like parallel importation and generic substitution subject to given conditions. But even with its potential for public health, the application of these flexibilities was strongly resisted legally and geopolitically most significantly in the lawsuit launched by the Pharmaceutical Manufacturers' Association (PMA) in 2001, when 39 pharmaceutical manufacturers sued the government of South Africa for enabling parallel imports and generic substitution through amendments. The *Pharmaceutical Manufacturers' Association of South Africa v. President of the Republic of South Africa* case attracted international criticism, primarily from civil society and international NGOs, who viewed it as a ploy to promote patent monopolies over human lives. The firms ultimately dropped the case in the face of increasing public and international pressure, including from the Clinton administration, marking a turning point in public health advocacy.⁶⁹⁵

One of the most important and precedent-setting cases in this area was *Minister of Health v. Treatment Action Campaign* (2002), which brought into sharp focus the fundamental constitutional aspects of access to medicine. In this case, the Constitutional Court of South Africa held that the government had defaulted on its constitutional mandate under Section 27 of the Constitution, which guarantees access to health care services. The Court ordered the state to provide Nevirapine a drug of pivotal importance for preventing mother-to-child transmission of HIV in public health facilities. Crucially, the Court's decision didn't depend on international trade law or TRIPS exceptions for patents, but instead on the constitutional right to dignity and life, thus locating public health within the national legal framework outside the scope of intellectual property law. The activism of NGOs like the Treatment Action Campaign (TAC) and Médecins Sans Frontières (MSF) played a critical role in changing discourse and putting pressure on both the South African government and pharmaceutical companies.⁶⁹⁶ Their activism reached beyond courtrooms into public debate and international

⁶⁹⁴ *Pharm. Mfrs. Ass'n of S. Afr. v. President of the Republic of S. Afr.*, Case No. 4183/98 (High Ct. S. Afr.).

⁶⁹⁵ *Minister of Health v. Treatment Action Campaign*, 2002 (5) SA 721 (CC) (S. Afr.).

⁶⁹⁶ Carlos M. Correa, *Intellectual Property Rights, the WTO and Developing Countries: The TRIPS Agreement and Policy Options* (Zed Books 2000).



policy forums, forging a rights-based discussion about access to life-saving medicines. This movement spurred important policy changes, such as the 1996 National Drug Policy and generic procurement initiatives more generally across the public sector.

Despite these triumphs, South Africa has had limited utilization of compulsory licensing provisions compared to nations such as India or Brazil. This underutilization is also due in part to the structural weaknesses in its domestic patent regime, such as the lack of substantive examination of patents (before the new IP policy was introduced in 2018), limited capacity for domestic pharmaceutical manufacturing, and reliance on imported active pharmaceutical ingredients (APIs). The Patent Amendment Bill, proposed after the Intellectual Property Policy Phase I (2018), tries to address all this by bringing in a patent examination system, utilizing more stringent patentability requirements, and enhancing transparency. The process of reforms has been sluggish, though, and compulsory licensing has been an underutilized tool in the public health toolkit in India.⁶⁹⁷ More broadly, South Africa's experience with compulsory licensing and patent law for pharmaceuticals highlights the preeminence of constitutional rights and public interest litigation in determining access to medicines. It further demonstrates how civil society can draw on both domestic and global pressure to oppose TRIPS-plus enforcement and realign patent policy along public health goals. But the efficacy of such mechanisms in the future will depend on effective legal reform, state capacity, and political will to apply TRIPS flexibilities in the face of global economic pressure.

COMPARATIVE LEGAL AND POLICY ANALYSIS

The legal and policy regimes for compulsory licensing in India, Brazil, and South Africa differentiate according to different constitutional architectures, institutional capacities, and political economies.⁶⁹⁸ Although the three jurisdictions fall within the category of developing countries with constitutional provisions for public health, the facilitation of issuing compulsory licenses, the extent of the divide between executive and judiciary, and the potential to resist international pressure differ significantly. A comparative analysis brings out both the utilitarian potential and the enduring limitations of compulsory licensing as a mechanism to promote fair access to drugs.⁶⁹⁹

Regarding legal thresholds and procedural formalities, India provides one of the strongest and well-enunciated structures under Section 84 of the Patents Act, 1970, amended in 2005. It provides an express provision for any interested party to request a compulsory license three years from the grant of the patent if any one of the following requirements is fulfilled: (i) reasonable needs of the public are not met, (ii) the patented invention is

⁶⁹⁷ Susan K. Sell, *Private Power, Public Law: The Globalization of Intellectual Property Rights* (Cambridge Univ. Press 2003).

⁶⁹⁸ Amy Kapczynski, *The Access to Knowledge Mobilization and the New Politics of Intellectual Property*, 117 *Yale L.J.* 804 (2008).

⁶⁹⁹ U.N. Dev. Programme, *Global Comm'n on HIV and the Law: Risks, Rights & Health* (2012).



not provided at a reasonably affordable price, or (iii) the invention is not worked within the territory of India. This three-fold test, which is judicially reviewable by the Intellectual Property Appellate Board (IPAB) or the courts, provides a formal mechanism for compulsory licensing. The procedural effectiveness of this paradigm is demonstrated through the *Natco v. Bayer* case (2012), in which the Controller General issued a license based on high pricing and non-working locally. Furthermore, India's judiciary has been playing an ongoing role in interpreting patent law from a public health perspective, upholding the preeminence of constitutional rights and public interest.

Conversely, Brazil has a more executive-oriented procedure, specifically under Article 68 of the Brazilian Industrial Property Law (Law No. 9.279/1996), according to which the government can grant compulsory licenses in instances of national emergency or public interest. Brazil's political leadership, specifically that of President Lula da Silva, used this provision in practice during the AIDS epidemic actively, threatening compulsory licensing as a leverage measure to intimidate drug companies into granting voluntary licenses or lower prices. Brazil granted a compulsory license for the AIDS medication Efavirenz in 2007 on grounds of excessive pricing by Merck. This executive-driven, top-down model showed high political will but also illustrated the shortcomings of relying mainly on licensing as a short-term strategic negotiation strategy rather than an enduring institutional tool. The judiciary in Brazil has traditionally played a secondary role in this area, based on a different constitutional culture in which public health policies are mostly administrative in nature, not judicial.⁷⁰⁰

South Africa, on the other hand, has a hybrid and developing system based on constitutional principle but previously lacked legislative and administrative distinctness necessary to implement compulsory licensing. Although theoretically enabled for compulsory licensing by the Medicines and Related Substances Control Act and Patents Act, the mechanism is ridden with uncertainty and has never been widely utilized. Rather, public health policy has depended largely on constitutional litigation as it did in the Treatment Action Campaign case to obtain access to medication. The judiciary, most notably the Constitutional Court, has taken a lead in developing the state's responsibility to provide access to healthcare under Section 27 of the Constitution. But because South Africa lacked a strong patent examination system (before 2018 reforms) and a weak manufacturing base, it has not been able to leverage the maximum use of TRIPS flexibilities. It is only now, with the implementation of the IP Policy Phase I and awaiting the Patent Amendment Bill, that South Africa is heading towards a clearer compulsory licensing scheme.

Institutional capacity is a central determinant of the viability of compulsory licensing. India and Brazil enjoy robust domestic pharmaceutical sectors with the capability of producing high-quality generics at scale. Indian

⁷⁰⁰ World Health Org., *Public Health, Innovation and Intellectual Property Rights: Report of the Commission on Intellectual Property Rights, Innovation and Public Health* (2006).



drug companies such as Natco and Cipla, and Brazilian public producers like Farmanguinhos, have supplied the technological underpinning required for successful application of compulsory licenses. South Africa, even with attempts to support domestic production, is still reliant on imports, most notably for active pharmaceutical ingredients (APIs), which precludes the viability of compulsory licensing as an immediate solution. Institutional capability therefore not only dictates capability to grant a license but also capability to make such a license effective. International political pressure and retaliatory trade sanctions remain stable across all three countries, particularly by the USTR's Special 301 Reports which annually lists countries believed to threaten the rights of pharmaceutical patents. India has been repeatedly placed on the watch list in these reports, while Brazil has also experienced periods of being listed for inadequate IP enforcement and other trade barriers. Listings in these lists tend to portend trade retaliations or diplomatic pressure, potentially with chilling effects on states' willingness to use compulsory licenses. India and Brazil have been more ready to stand up to such pressures than South Africa, however, where economic vulnerability and political restraint have muted assertiveness in patent policymaking.⁷⁰¹

India, Brazil, and South Africa's experiences collectively provide valuable lessons for global health governance. First, the legal expression of compulsory licensing is accompanied by a mixture of judicial independence, executive willingness, and institutional ability. Second, TRIPS flexibilities are necessary but incomplete in themselves; their operation needs to be complemented by domestic legal infrastructure as well as political will to resist foreign pressure. Third, civil society pressure and judicial accountability can help instigate state action, as one could vividly witness in South Africa. Lastly, these models pinpoint the imperative for a new orientation of global IP governance to a more democratic model that puts public health ahead of private patent monopolies. As the COVID-19 pandemic and ensuing vaccine inequalities have made clear, the international structure of IP law continues to be tilted in favor of high-income countries and transnational corporations. The policy innovation and jurisprudence of these three Global South countries indicate that there are other models, and need to be other models, if the potential of TRIPS Article 7 and the public health focus of the Doha Declaration are to be realized.

CHALLENGES AND BARRIERS TO EFFECTIVE IMPLEMENTATION

Despite the existence of a legal framework for compulsory licensing under the TRIPS Agreement and its reiteration under the Doha Declaration, the effective use of these flexibilities in practice is beset with difficulties. For most developing countries, the theoretical entitlement to grant compulsory licenses is papered but frequently collapses in practice due to a multifaceted array of procedural, technological, political, and

⁷⁰¹ James Love, *Remuneration Guidelines for Non-Voluntary Use of a Patent on Medical Technologies*, World Health Org./U.N. Dev. Programme (2005).



institutional hurdles. These barriers not only restrict the potential of compulsory licensing to provide affordable access to drugs but also capture wider structural inequities inscribed within the global intellectual property system.⁷⁰²

One of the most direct barriers to compulsory licensing is found in the administrative complexity and procedural delays required to obtain such licenses. Article 31 of the TRIPS Agreement sets out a strict regime of requirements to be met before the grant of a compulsory license is legally possible. These are negotiation with the patent owner ahead of time for a voluntary license, other than in national emergency or cases of extreme urgency, and identification of remuneration sufficient for the patent owner. National regulations frequently introduce additional bureaucratic steps, such as hearings, extensive documentation, and lengthy review procedures by patent offices or courts. These procedural hurdles can cause serious delays, which are especially harmful in the context of public health crises where time is of the essence. For example, the requirement to prove that the "reasonable requirements of the public" are not satisfied or that the patented medicine is not "reasonably affordable," as under Indian law, imposes a substantial evidentiary burden on the applicant. Again, the threat of retaliatory litigation by influential drug companies may further deter regulators and impede administrative action.⁷⁰³

Another institutional barrier is the absence of manufacturing and technological capability, especially in poor nations that do not have a highly developed pharmaceutical industry. Compulsory licensing works only if the state or a licenced party can produce the drug concerned or import it from a capable third party. This is exacerbated by the reliance of most countries on imports of active pharmaceutical ingredients (APIs) the essential building blocks of drug products by a few suppliers, primarily India and China. Even where a compulsory license is granted, a country lacking the infrastructure or scientific capacity to manufacture intricate patented medications will not be able to put the license into effect. This was one of the principal motivations for the establishment of Article 31bis (the Paragraph 6 system), under which countries with manufacturing capability can ship to countries without. However, as evidenced in Canada's exportation of antiretrovirals to Rwanda, this mechanism has been used only marginally because of its procedural complexity and lack of incentives for generic producers.

Trade-related pressure from developed nations' political economy also limits the useful application of compulsory licenses. The United States, for instance, has been accustomed to exerting a lot of pressure with tools like the Special 301 Report presented by the Office of the United States Trade Representative (USTR), which lists nations found to have poor IP protection. India, Brazil, and Thailand have all experienced diplomatic and economic pressure since invoking or even contemplating compulsory licenses. These pressures tend to be

⁷⁰² Sivaramjani Thambisetty, *Compulsory Licensing of Patents: A Comparative Study of India, Brazil, and South Africa*, 2 J.L. & Dev. (2015).

⁷⁰³ Oxfam Int'l, *Patents Versus Patients: Five Years After the Doha Declaration* (2006).



tied to the wider trade talks and appear in the form of threats to suspend trade privileges, downgrade economic relations, or slow technology transfer. Such coercive practices "TRIPS-plus" measures are sometimes called. They aim to limit the application of TRIPS flexibilities in bilateral and regional free trade agreements, thus reducing developing countries' policy space. Consequently, even those with strong legal regimes may abstain from granting compulsory licenses for fear of damaging diplomatic or trade relations with influential states and pharmaceutical lobbies.⁷⁰⁴

Another, though less studied but no less serious, challenge is the misapplication or misinterpretation of TRIPS flexibilities by developing countries themselves. In most cases, policymakers within country and legal professionals are not aware of the full extent of TRIPS flexibilities or are discouraged by the perceived risk and complexity of applying them. Some nations have implemented overly constraining or copying advanced-country-style patent laws, not seizing the latitude for interpretation provided by TRIPS. Moreover, the lack of transparent institutional guidelines and political will tends to cause compulsory licensing provisions to be applied on an ad hoc or non-standard basis. For instance, whereas India took audacious recourse to compulsory licensing in *Bayer v. Natco*, subsequent hesitation to issue licenses in subsequent cases indicates an internal dilemma, possibly being prompted by international lobbying as well as indecision regarding the long-term policy ramifications. Likewise, South Africa's early jurisprudential battles over drug pricing were undermined by uncertainty regarding the extent of available action under TRIPS, taking years of activism and court intervention to sort out state power.⁷⁰⁵

Together, these challenges expose that the issue is not one of law but rather fundamentally systemic. The global patent regime's architecture remains biased in favor of private commercial interests over public health objectives, even as the formal safeguard of flexibilities under the TRIPS Agreement has been reaffirmed. To be an effective access-improving tool, compulsory licensing needs to be buttressed with facilitating legal infrastructure, adequate technological capacity, and a firm political will to subordinate health to profit. No less significant is the international assistance diplomatic and technical alike to equip developing countries with the ability to exercise their rights without suffering inordinate retaliation or procedural entanglements. It is only through a comprehensive and coordinated approach that the potential of TRIPS flexibilities can be converted into actual public health results.⁷⁰⁶

REFORM AND RECOMMENDATIONS

The COVID-19 pandemic exposed the shortcomings and disparities of the current global pharmaceutical patent regime. It became more obvious that the TRIPS Agreement, as it stands, is inclined to favor the rights

⁷⁰⁴ Médecins Sans Frontières, *Compulsory Licensing in Practice: A Toolkit for Activists* (2007).

⁷⁰⁵ World Health Org., *Essential Medicines and Health Products Database*.

⁷⁰⁶ Médecins Sans Frontières, *Access Campaign Resources*.



of patent owners over fair access to life-saving medicines. This chapter makes the case for an adjustment of world IP governance, specifically the revision of the TRIPS Agreement to more adequately capture the demands and limitations of the Global South. At its center is the idea that health justice cannot be sacrificed to market monopolies or legalistic formalism. There have also been international demands to revisit and revise TRIPS provisions particularly Article 31 to make the process of resorting to compulsory licenses no longer bogged down in formalism.⁷⁰⁷

These changes need to include minimising bureaucratic delays involved in granting licenses, leaving less room for vague wording regarding "adequate remuneration," and eliminating the chilling effect of the threat of retaliation from economically more powerful countries and drug giants. The COVID-19 TRIPS Waiver proposal, backed jointly by India and South Africa at the WTO, demonstrates increasing agreement among developing countries that compulsory licensing must be an accelerated, more self-guiding process in times of health crises. Even though the 2022 waiver did not meet expectations, it rekindled discussion of the need for a new legal imagination driven by justice and solidarity. One key area for reform is creating regional systems for pooled procurement, local production, and joint licensing strategy. Organizations like the African Medicines Agency (AMA) and programs such as PAHO's Strategic Fund provide good models of South-South cooperation.⁷⁰⁸

These systems can enable low-capacity countries to unite and exercise their rights under international law while minimizing reliance on Northern markets. Besides, regional compulsory licensing schemes in which an association of nations collectively issues and enforces licenses can overcome the limitations of Paragraph 6 of the Doha Declaration, which has remained largely ineffective because of its complicated export/import scheme. To remedy the long-term pharmaceutical inequity, it is crucial that developing nations adopt a proactive rather than reactive IP stance. This requires not just applying compulsory licensing properly but also developing local pharmaceutical R&D environments through selective public investment, government-supported policies for innovation, and public-private collaboration. Through developing local capabilities in Active Pharmaceutical Ingredient (API) manufacturing, clinical trials, and biopharmaceutical research, these nations can be less dependent on foreign technologies and better placed to fight patent monopolies where needed.⁷⁰⁹

At the normative level, there needs to be a mainstreaming of a human rights approach to intellectual property law into national and international legal frameworks. Treating access to medicines as a human right entails that intellectual property protection should be secondary to the right to life and health, especially in case of vulnerable groups. This method demands the harmonization of IP policy with the UN's Sustainable Development Goals (specifically SDG 3: Good Health and Well-being), the International Covenant on

⁷⁰⁷ South Centre, Policy Briefs on TRIPS and Public Health.

⁷⁰⁸ Knowledge Ecology Int'l, Reports and Briefings on Compulsory Licensing.

⁷⁰⁹ U.N. Conf. on Trade & Dev., Reports on Trade and Development and Intellectual Property.



Economic, Social and Cultural Rights, as well as the UN Human Rights Council's resolutions on access to medicines. The national courts of countries like South Africa and India have been instrumental in the interpretation of the patent legislations under this framework.⁷¹⁰

The recasting of international pharma patent regulation requires more than mere technical solutions. It requires a philosophical and architectural transformation of how we conceive the role of IP law in society. Innovation need not be incentivized at the expense of human dignity, and patents should not become tools of exclusion. An inclusive and multilateral discussion based on empirical facts and moral obligations is needed to make sure that the international IP system is purposeful for the 21st century.

CONCLUSION

The comparative analysis of India, Brazil, and South Africa finds a complex but cogent story about the use of compulsory licensing as a political and legal instrument to promote public health interests in the Global South. All these countries, though situated within the same general TRIPS paradigm, have developed context-specific approaches to resisting the monopolistic grip of pharmaceutical behemoths, usually facing enormous legal, diplomatic, and economic pressure. Their stories tell both the promise and the limits of compulsory licensing as a tool for reconciling intellectual property rights with the needs of human well-being. India's issuance of a compulsory license for Nexavar in 2012 demonstrated the legal viability of invoking Section 84 of the Indian Patents Act to ensure affordable access to life-saving medication. It also signaled a willingness to prioritize public health over foreign investment concerns, albeit at the cost of subsequent backlash from multinational pharmaceutical companies and trade partners. Brazil, by contrast, deployed the threat of compulsory licenses as a strategic bargaining chip, particularly during its negotiations over antiretroviral drugs. Its 2007 license for Efavirenz marked a significant milestone in leveraging state power to drive down prices while enhancing local production capacity through public institutions like Fiocruz. South Africa's path, informed by its constitutional commitment to the right to health and its painful history with the HIV/AIDS crisis, saw a sustained legal and political campaign to reform its patent laws and assert sovereignty over health policy. While the country has not frequently used compulsory licensing mechanisms in practice, its broader legal framework has created space for such interventions when necessary.⁷¹¹

Together, these case studies demonstrate that the loophole of compulsory licensing is not merely an instinctual relic of international law but a feasible mechanism that can be exploited choosing and strategically to increase access to life-saving medicines. But their stories also speak to the multiple restraints that developing countries are faced with in operationalizing such measures. These internal barriers include administrative inertia, lack of

⁷¹⁰ Third World Network, Publications on IP and Health Access.

⁷¹¹ Treatment Action Campaign, Advocacy Materials and Court Submissions.



technological infrastructure, and scarce domestic manufacturing capability, and external barriers include diplomatic intimidation, threats of trade sanctions, and deep entrenchment by the global pharmaceutical industry in the international policy-making forums. On the other hand, compulsory licensing is one of the few flexibilities remaining under TRIPS, which a developing country may invoke without seeking the permission of the patent holders. Its continued relevance depends on the political will of states, the support of civil society, and the ability of national institutions to withstand pressure from more powerful actors. The mechanism is not a silver bullet; it cannot, on its own, create pharmaceutical self-reliance or equitable health outcomes. But it can and has functioned as a critical corrective in moments of pharmaceutical apartheid, where access is determined not by need but by purchasing power. Looking ahead, the future of global IP governance must be guided by the lessons of these countries and the broader ethical question of who gets to live and at what cost. The COVID-19 pandemic demonstrated that global solidarity around access to medical innovations remains aspirational, not operational. It is, therefore, essential to reimagine international patent law as a more inclusive and responsive system one that reflects the realities of inequality and affirms the primacy of human dignity over market exclusivity. This will involve not only legal changes, but a paradigm shifts in the manner the world weighs incentives for innovation against duties to public health. In this changing world, compulsory licensing can be viewed not as the rule of exception but as a standard, appropriate tool of public health administration a part of a full range of legal, diplomatic, and technical weapons that nations need to possess in order to guarantee that no one is deprived of medicine because of their location or wealth. The struggle for public health justice is ongoing, but through the strategic use of existing legal flexibilities and the imaginative pursuit of new governance models, a more equitable future remains within reach.



CHAPTER 22

PATENTABILITY OF MICROBIAL INNOVATIONS: A LEGAL ANALYSIS OF DISCLOSURE AND ELIGIBILITY UNDER INDIAN AND INTERNATIONAL FRAMEWORKS

- Dr. Diksha Mishra*

ABSTRACT

*The use of microorganisms in industrial applications has a long-standing history, recently accelerated by advancements in gene editing and the growing emphasis on carbon-neutral technologies. However, as biotechnology innovations increase, so do the legal complexities in protecting microbial inventions. The present research investigates the intersection of patent law and biotechnology, particularly focusing on disclosure and patent eligibility requirements for inventions involving microorganisms under Indian and European patent frameworks. The central research question guiding this study is: To what extent do Indian patent disclosure and subject matter eligibility requirements align with international standards in protecting biotechnological innovations involving microorganisms? This inquiry adopts a doctrinal legal research methodology, critically analysing statutory provisions, judicial interpretations, and international treaty obligations such as the Budapest Treaty. The case of *The Regents of the University of California v. Controller of Patents* (C.A.(COMM.IPD-PAT) 481/2022) serves as a focal point, with the Delhi High Court emphasizing the non-negotiable nature of disclosure under Sections 10(4) and 10(5) of the Indian Patents Act and reiterating the exclusion of naturally occurring biological materials under Section 3(c). The study also draws comparative insights from the European Patent Convention (EPC), particularly Article 83, and U.S. jurisprudence such as *Amgen v. Sanofi*. Findings highlight that overly broad and insufficiently enabled claims, particularly in microbial biotechnology, are prone to rejection. The ruling underscores the necessity of clear, concise claims, supported by experimental data, and the mandatory deposition of biological materials not otherwise accessible. While some critique exists regarding the court's narrow interpretation of claim breadth and enablement, the case establishes a significant precedent for drafting biotechnology patent applications in India.*

KEYWORDS: Biotechnology patents, microorganisms, patent disclosure, Budapest Treaty

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INTRODUCTION

The use of microorganisms in industry is an age-old practice, but has increased markedly in recent years. The role of microbial communities in the human body has been discussed widely owing to their role in fermented food, probiotics and postbiotics. On the other side, impetus laid on establishing a carbon-neutral industry, and the dawn of the gene editing era has further accelerated development in industrial technology. As the industry witnesses growth, there are equal probabilities for counterfeit products entering the market. We have patent laws and trade secrets to prevent this and incentivise the inventor. However, since the invention involves microorganisms, there are major concerns involved.

PATENTABILITY OF MICROORGANISMS: INDIAN POSITION

Initially, the Indian Patent Law was conservative, though it encouraged technological innovation while safeguarding public interest. Thus, it excluded several biological inventions, including microorganisms. Under Indian Patent Law, before 2002, microorganisms were essentially not considered patentable in India and were treated as natural discoveries rather than inventions. Courts and patent law categorically denied patent protection to microbial inventions. However, owing to the rapid advancement in biotechnology and driven by India's commitment to Trade-Related Aspects of Intellectual Property Rights (TRIPS), the Indian Patent Act, 1970, has been amended substantially to comply with provisions of the TRIPS agreement.

Article 27 of TRIPS specifically mandated that microorganisms must be considered patentable subject matter, though it allowed countries to exclude plants and animals other than microorganisms. To comply with the international standards, the Indian Patents (Amendment) Act, 2002 was introduced, which proved to be one of the turning points since the inclusion of microorganisms as a patentable subject matter has paved the way for microbiological innovation in India.⁷¹² Section 3(j) of the Patents Act was amended to exclude only plants and animals from patentability, without mentioning microorganisms, thereby making them patentable subject matter under Indian law. It has been pivotal in fostering research and development in agriculture, biotechnology, pharmaceuticals and environmental science. The Budapest treaty regulates the deposition of microorganisms with designated International Depository Authorities (IDAs), along with the availability of such organisms that are not fully described and not publicly accessible. According to the Budapest Treaty, the microorganism must be deposited with a designated International Depository Authority. India has been a signatory to the Budapest Treaty since 2001. This ensures that the microorganism is available for examination and reproducibility in future.

According to the TRIPS agreement, the following microbial inventions are patentable:

⁷¹²Agreement on Trade-Related Aspects of Intellectual Property Rights, Article 27(3)(b), Marrakesh Agreement Establishing the World Trade Organization, 1994 (WTO).



- 1) The process of creating a new microorganism.
- 2) A new microorganism produced by the specified process
- 3) A new microorganism in its own right;
- 4) The process of cultivating or utilising a known or new microorganism to

PATENTABILITY OF MICROORGANISMS: JUDICIAL INSTANCE

The judicial turning point for the microbial patent in India came with the *Dimminaco AG v. Controller of Patents* (2002), wherein Dimminaco AG, a Swiss company, applied for a patent on a process for producing a live vaccine using a microorganism.⁷¹³ The Indian Patent Office initially rejected the application because the process involved living organisms, which, under Indian law, were not considered patentable at the time.⁷¹⁴ Later, the Dimminaco AG challenged the decision in the Calcutta High Court, which gave its ruling in favour of the applicant. The Court held that as long as the process involving a microorganism fulfilled the established patentability criteria of novelty, inventive step and industrial application it qualifies to seek patent. The Court held that a manufacturing process involving a live-virus-based vaccine qualifies as patentable even though the end product is a living organism, by applying a “vendibility” test over the “manner of manufacture” approach. The case paved the way for biotechnological inventions to be viewed as products or processes, post-amendment to the Patent Act, 2002. Patent (Amendment) Act, 2002, in compliance with India’s TRIP obligations, formally allowed patenting microorganisms, removing them from the non-patentable category under Section 3(j). India initially began to grant product patents for microorganisms 5 years after the patent was granted, but now it is only for a standard time of 20 years from the filing date. Naturally occurring microorganisms remain non-patentable as they are considered mere discoveries under Section 3(d). Only human-modified or genetically engineered microorganisms that demonstrate novelty, inventive steps, and industrial application qualify to seek a patent grant. The Patent Act and Patent Rules operate alongside the Biological Diversity Act, 2002, and related rules regulate access to biological resources and require benefit sharing and compliance disclosures. Enforcement of patent rights in India can sometimes be challenging, as the line between natural and modified organisms can be blurred. The *Monsanto Technology LLC v. Nuziveedu Seeds Ltd.* case primarily dealt with genetically modified seeds (GMOs) and the broader issue of patent rights in biotechnology.

ENABLING DISCLOSURE REQUIREMENT

The need for disclosure requirements in patent law is for the patentee to disclose adequate information to the world for others to work the invention. Such disclosures are also necessary so that the research in adjoining

⁷¹³ *Dimminaco AG v Controller of Patents and Designs*, (2002) IPLR 255 (Cal).

⁷¹⁴ Choudhary, L., & Kumar, A. (2022). Stem Cell Patenting: Moral and Legal Dilemma. Available at <https://doi.org/10.56042/jipr.v27i1.53897>.



areas not covered by the patent can continue. It is important to note that the disclosure requirement in the case of biotech technologies is relatively hard to prove. The patent office must provide reasoning with an evidentiary basis before rejecting patent applications. It is equally essential for a patent controller to be procedurally fair in how it concludes, i.e. the examination report must contain detailed objections, including the evidentiary basis, to allow the patent applicant to avail an opportunity to present a defence. In the recent judgment of the Delhi High Court, the court concluded that the patent specification does not disclose the inventive contribution fully. Still, the court omits providing an evidentiary basis for the conclusion. The most recent judgment highlights the patent specification disclosure requirement, especially in biotechnology. The court also uses the word 'shall,' which makes it mandatory for the complete specification to be valid in India. Therefore, the patent disclosure must enable the invention to be described sufficiently for a person skilled in the art to work on the invention without any undue experimentation.

It should disclose the best mode for working out the invention known to the applicant when the application was filed. The disclosure must be supported with the complete breadth of claims by way of some examples or experimental data.⁷¹⁵ There are several grounds on which the order has been criticised. First, in arriving at the rejection, the court only focused on the breadth of the claims, common in biotech inventions, without adequately considering whether a skilled person could work the claims without undue experimentation. The Court did not fully consider the underlying invention of identification and claiming the genes of loss of function of mutations, and that the specifications covered all possible mutations consisting of insertion, deletions, substitution, including loss of function mutations and hence appears to be an incorrect interpretation.

ENABLING DISCLOSURE REQUIREMENT: POSITION IN EUROPE & U.S

In the European Patent Convention (EPC) framework, Article 83 EPC mandates that the application disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.⁷¹⁶ The EPO has held in several cases that a mere deposit without a reproducible method or functional description is insufficient. This corresponds to Indian Patent Act Section 10(4), reinforcing a universal principle that no monopoly can be granted without full enablement.

The U.S. Supreme Court in *Amgen v. Sanofi* reinforced the “enablement” requirement under 35 U.S.C. §112. The court rejected Amgen’s broad genus claims for antibodies because the specification failed to enable the full scope of claims without undue experimentation. A patent must allow a skilled artisan to teach the invention.

⁷¹⁵ Delhi High Court Lays Down Disclosure Requirements For Patent Applications - Patent - India. Available at <https://www.mondaq.com/india/patent/1595352/delhi-high-court-lays-down-disclosure-requirements-for-patent-applications>.

⁷¹⁶ Bohatchuk, D. (2023). Transparency as a legal value for patent disclosure. Available at <https://core.ac.uk/download/668143530.pdf>.



European and U.S patent law illustrate a growing global consensus. That disclosure is not a formality, but a quid pro quo for patent protection.

Courts are unwilling to grant monopolies over broad, vaguely described biological materials, even if deposited. The public interest in access to basic biological information is considered to be paramount. The role of the Budapest treaty is critical in bridging the gap between the physical material and legal description, but it cannot replace clear and complete enablement. In the Regent case, the ruling exemplifies a judicial stance that prioritises transparency and public access over the expansive claims of patent applicants, especially in biotechnology. By aligning the Indian standards with those of EPC and U.S jurisprudence, the decision underscores a maturing global standard in biotech patenting.

REGENTS OF THE UNIVERSITY OF CALIFORNIA. THE CONTROLLER OF PATENTS (C.A.(COMM.IPD-PAT) 481/2022)

The Indian courts have time and again navigated the tension between protecting innovation and preventing monopoly over natural biological resources. Indian courts have adopted a strict approach and have declined to grant a patent for what can be found in nature. The court emphasised clear human inventive contributions, e.g., Engineering microorganisms, new use, or technical modification. This ensures that the court denies the claims that unduly monopolise natural processes or biological diversity.

The Delhi High Court has clarified that patent applicants must strictly comply with disclosure requirements in drafting complete specifications and interpreted the scope of Sections 3(c), 10(4) and 10(5) of the Patent Act in a recent decision.⁷¹⁷ The court has taken the opportunity in the Regents of the University of California. The Controller of Patents (C.A.(COMM.IPD-PAT) 481/2022) to clarify that complying with disclosure requirements in drafting complete specifications is not negotiable. Section 3(c) excludes “the mere discovery of scientific principles or formulation of an abstract theory or discovery of any living thing or non-living substances occurring in nature.

Section 10(4) requires that complete specifications to –

- i) Fully and particularly describe the invention and its operation, or the method by which it is to be performed.
- ii) Disclose the best method of performing the invention known to the applicant and for which he is entitled to claim protection.

Additionally, if the specification mentions a biological material which may not be described as above and if such material is not available to the public, the Applicant must also deposit the material to an international

⁷¹⁷ Delhi High Court Lays Down Disclosure Requirements For Patent Applications - Patent - India. Available at <https://www.mondaq.com/india/patent/1595352/delhi-high-court-lays-down-disclosure-requirements-for-patent-applications>.



depository authority under the Budapest Treaty as per the conditions mentioned under 10(4)(d)(ii).⁷¹⁸ Section 10(5) requires that claims be clear, succinct and fairly based on the matter disclosed in the specification. Delhi High Court concerning the submission of biological material to an International Depository Authority (IDA) under the Budapest Treaty held that since the patent application did not meet the requirements of sufficiency of disclosure and enablement as provided under Section 10(4)(a) and Section 10(4)(b) of the Act, the proviso to Section 10(4)(d) of the Act would be applicable.⁷¹⁹ It was clarified that for the subject application, it is the deposition of the recombinant *Salmonella* that is required and not the source bacteria, since the invention relates to a biological material available to the public (reference is made to the Patent Office Guidelines for Examination of Patent Applications in the Field of Pharmaceuticals, October 2014). Further, since the scope of the subject patent application is broad and insufficient, the claimed invention also covers naturally occurring mutations. Thus, the claims do not qualify as patent-eligible subject matter as per Section 3(c) of the Act.

While dismissing the appeal, the Hon'ble Court upheld the decision and findings of the Indian Patent Office (IPO) in respect of insufficient disclosure, since the working examples are limited to deletion mutations would not enable as PSITA (microbiology) to perform the claimed invention, absence of detailed support or embodiments including insertions and substitutions, and the naturally occurring mutations to *Salmonella* render it ineligible for patentability under the Indian patent laws. This ruling could create a precedent that undermines the patentability of recombinant genes by equating them to natural discoveries, merely because of a lack of specific examples in the specifications. Despite its shortcomings, the case underlines the importance of meeting the enablement and disclosure requirements set forth under Section 10 of the Patents Act. This judgment is also aligned with the ruling of the U.S Supreme Court in *Amgen v. Sanofi*, wherein on enablement it was explained that “if a patent claims an entire class of processes, machines, manufactures or composition of matter, the patent's specification must enable the full scope of the invention as defined by the claims. The more one claims, the more one must enable.”

In light of the recent judgment, patent applicants in the biotech domain must provide clear and concise claims fully supported by a detailed description and experimental data. Deposition of biological material is also essential in a biotech patent application. Overly broad claims lacking adequate disclosure are susceptible to rejection. This case also serves as a critical reminder to ensure that patent applications are well drafted, comply with enablement, and meet disclosure standards, which are essential to secure patent protection.

⁷¹⁸ International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, WTO Agreement, 1977 (Budapest).

⁷¹⁹ Biological Material and Written Description Requirement under Patent L. Available at <https://www.asialaw.com/NewsAndAnalysis/biological-material-and-written-description-requirement-under-patent-law/Index/1912>



In this case, the court upheld claims that are naturally occurring endogenous mutations, falling under the non-patentable subject matter category of Section 3(c). The Court opined that several loss-of-function mutants of the *Salmonella* microorganism referred to in claim 1 are present naturally. Hence, the broad claims on such endogenous mutation also covered naturally occurring variants of *Salmonella* bacteria. A loss-of-function mutation is not permissible under Section 3(c). The Court also observed that the detailed description should have ensured that the subject patent application does not cover naturally mutated *Salmonella* microorganisms, which are excluded under Section 3(c) of the Act.

There are several grounds on which the order has been criticised. First, in arriving at the rejection, the court only focused on the breadth of the claims, common in biotech inventions, without adequately considering whether a skilled person could work the claims without undue experimentation. The Court did not fully consider the underlying invention of identification and claiming the genes of loss of function of mutations, and that the specifications covered all possible mutations consisting of insertion, deletions, substitution, including loss of function mutations and hence appears to be an incorrect interpretation.

The need for disclosure requirements in patent law is for the patentee to disclose adequate information to the world for others to work the invention. Such disclosures are also necessary so that the research in adjoining areas not covered by the patent can continue. It is important to note that the disclosure requirement in the case of biotech technologies is relatively hard to prove.

The patent office must provide reasoning with an evidentiary basis before rejecting patent applications. It is equally essential for a patent controller to be procedurally fair in how it concludes, i.e. the examination report must contain detailed objections, including the evidentiary basis, to allow the patent applicant to avail an opportunity to present a defence. In the recent judgment of the Delhi High Court, the court concluded that the patent specification does not disclose the inventive contribution fully. Still, the court omits providing an evidentiary basis for the conclusion.

The most recent judgment highlights the patent specification disclosure requirement, especially in biotechnology. The court also uses the word 'shall,' which makes it mandatory for the complete specification to be valid in India. Therefore, the patent disclosure must enable the invention to be described sufficiently for a person skilled in the art to work on the invention without any undue experimentation. It should disclose the best mode for working out the invention known to the applicant when the application was filed. The disclosure must be supported with the complete breadth of claims by way of some examples or experimental data. There are several grounds on which the order has been criticised. First, in arriving at the rejection, the court only focused on the breadth of the claims, common in biotech inventions, without adequately considering whether a skilled person could work the claims without undue experimentation. The Court did not fully consider the underlying invention of identification and claiming the genes of loss of function of mutations, and that the



specifications covered all possible mutations consisting of insertion, deletions, substitution, including loss of function mutations and hence appears to be an incorrect interpretation.

CONCLUSION

Meticulous claim drafting is the key. The claim must focus on human-engineered differences so that broad language can inadvertently encompass natural variants. There must be continued education on nuanced guidelines to foster responsible innovation, especially among startups and academia. Circulars must be issued to address microbial patents that have been published beyond reinforcing deposit norms. Applicant must identify and disclose the source of biological material, and obtain necessary permissions/benefit-sharing. By fostering dialogue among stakeholders, scientists, policymakers, and local communities, we can develop a robust regulatory framework that promotes responsible biotechnological innovation while safeguarding the rights of individuals and protecting the environment. Ultimately, achieving this balance will not only enhance the potential for scientific progress but also ensure that the benefits of such advancements are shared equitably across society, paving the way for a more sustainable and just future.



CHAPTER 23

A STUDY ON THE CHALLENGES FACED BY INDIAN STARTUPS IN ACCESSING SEPS FOR 5G APPLICATIONS

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ABSTRACT

*The rollout of 5G technology promises to revolutionize connectivity and innovation across industries, yet it also brings to the forefront significant legal and structural challenges particularly for startups in developing countries like India. Central to this challenge is the concentrated control of Standard Essential Patents (SEPs) by a small group of global entities, creating steep entry barriers for Indian startups seeking to build interoperable 5G-enabled products and services. This study examines the key doctrinal and policy challenges Indian startups face in accessing SEPs for 5G applications, focusing on the intersection of patent law, competition regulation, and international licensing practices. Employing a doctrinal legal research methodology, the paper critically analyzes statutory frameworks such as the Patents Act, 1970, the Competition Act, 2002, and key judicial precedents including *Ericsson v. Micromax*. It also reviews global instruments like TRIPS and FRAND commitments within standard-setting bodies (SSOs). Through comparative legal analysis of regimes in the European Union, China, and the United States, the paper identifies best practices and institutional models that could inform Indian policy. Findings highlight the lack of clear FRAND licensing norms in India, the absence of regulatory oversight, limited government facilitation for SEP negotiations, and the exclusion of Indian startups from international patent pools and SSO negotiations. The study recommends the creation of a national SEP framework, royalty transparency guidelines, and public-private licensing support structures to ensure inclusive innovation. This research contributes to the broader academic discourse on intellectual property governance in emerging markets and suggests future directions for exploring compulsory licensing, SEP arbitration frameworks, and indigenous standard-setting.*

KEYWORDS: SEPs, FRAND, Licensing Barriers, Indian Startups, 5G Regulation, Challenges

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INTRODUCTION

The fifth-generation (5G) wireless technology represents a transformative leap in global communication systems. With ultra-low latency, high-speed data transmission, and massive connectivity, 5G enables disruptive innovations across sectors such as autonomous vehicles, remote healthcare, smart manufacturing, and the Internet of Things (IoT). For economies like India, 5G acts as a critical enabler in achieving digital inclusion, industrial growth, and technological self-reliance. However, 5G also presents a complex ecosystem governed by deeply embedded intellectual property rights (IPR), especially in the form of Standard Essential Patents (SEPs). These patents cover core technologies that must be implemented to comply with international 5G standards (e.g., 3GPP specifications). SEPs are patents that protect technologies indispensable to a technical standard. In the 5G domain, large multinational corporations such as Qualcomm, Nokia, and Huawei dominate the SEP landscape. Accessing these patents typically requires licensing on FRAND (Fair, Reasonable, and Non-Discriminatory) terms. However, the opaque nature of SEP licensing, high costs, and imbalanced negotiation dynamics often disadvantage startups and new entrants. SEPs thus act as both enablers and gatekeepers in the 5G value chain. Their role is particularly critical in a country like India where indigenous startups are key drivers of technological innovation, but often lack the legal, financial, and institutional capacity to navigate SEP licensing regimes.

IMPORTANCE OF STARTUPS IN INDIA'S DIGITAL AND TELECOM ECONOMY

India's startup ecosystem, ranked among the top 3 globally in terms of size, is central to the country's aspirations in 5G and digital technology. Startups in domains such as telecom software, IoT devices, AI, and network virtualization are developing next-generation solutions that rely heavily on 5G infrastructure. Government programs like Digital India, Start-up India, and the PLI scheme for telecom aim to empower startups in this space. However, the lack of affordable and transparent access to SEPs acts as a significant impediment to indigenous R&D and product deployment, particularly for early-stage companies without strong IPR portfolios.

STATEMENT OF THE PROBLEM

Despite India's robust startup ecosystem and policy support, systemic challenges in accessing SEPs continue to obstruct the entry of Indian startups into the 5G technology domain. These include high



licensing fees, negotiation asymmetries, lack of transparency in SEP declarations, and absence of regulatory safeguards. This study seeks to critically examine these issues through a legal and institutional lens to understand why Indian startups are struggling to gain fair and equitable access to SEPs for 5G applications.

REVIEW OF LITERATURE

D. Iwasiuk 2016, Iwasiuk explores the dual nature of emerging markets for technology startups, highlighting both infrastructural constraints and untapped growth potential. The article underscores issues such as inadequate funding channels, talent shortages, and regulatory unpredictability, while also noting expanding consumer bases, mobile penetration, and market gaps as lucrative opportunities. This source provides a balanced overview useful for understanding the macroeconomic and sociopolitical factors affecting entrepreneurial ecosystems in developing countries. Erin Griffith 2014, Griffith presents firsthand insights from startup founders regarding the most common causes of failure, such as flawed business models, poor timing, inadequate market research, and founder disputes. The piece draws heavily on qualitative accounts, giving it a reflective and experience-based perspective. This source is valuable for examining internal organizational and strategic pitfalls that differ from purely market-based challenges. A Mittal 2014, identifies government policies, funding limitations, and infrastructure as critical hurdles while highlighting technological adoption, youthful demographics, and international investor interest as significant growth drivers. The article emphasizes India's unique combination of structural constraints and innovation-friendly trends, making it a region-specific complement to broader emerging market studies.

Ghosh et al., 2019, Ghosh et al. provide a technically detailed account of 5G evolution beyond 3GPP Release 15, focusing on architectural changes, new radio technologies, and expected performance gains (throughput, latency, capacity). The paper stresses that 5G is not a single feature but a family of capabilities (enhanced mobile broadband, URLLC, massive IoT) enabled by changes at both radio and core network layers. It also highlights the practical engineering challenges for deployment (spectrum, densification, interoperability with LTE). This source serves as a rigorous engineering baseline for what 5G is and what its core promises are. Cho 2020, Cho's piece (State of the Planet) examines potential environmental effects of large-scale 5G rollouts: energy consumption due to densification, lifecycle impacts of new hardware, and indirect effects from enabling IoT applications. While not a



peer-reviewed empirical study, it compiles expert commentary and early evidence to argue that environmental impacts depend heavily on implementation choices (energy-efficient base stations, renewable power, equipment lifecycle management). The article foregrounds sustainability as an important non-technical dimension of 5G deployment.

5G SEPS AND THE LICENSING ECOSYSTEM

Standard Essential Patents (SEPs) are patents that protect technologies essential to comply with a specific technical standard. In the context of 5G, these include core functionalities such as radio transmission protocols, antenna management, low-latency communication, and massive machine-type communications. A patent is considered “essential” when it is not possible to manufacture, sell, or use a product compliant with a standard without infringing the patent. Therefore, implementers must license these SEPs to develop compliant technologies.

SEPs are declared primarily through Standard Setting Organizations (SSOs). When companies participate in the development of standards, they are typically required to disclose their relevant patents and commit to licensing them under FRAND (Fair, Reasonable, and Non-Discriminatory) terms. Declarations are made to organizations like:

- **ETSI (European Telecommunications Standards Institute)** – dominant in telecom standards
- **IEEE (Institute of Electrical and Electronics Engineers)**
- **3GPP (3rd Generation Partnership Project)** – which sets specifications adopted by ETSI for mobile communications including 5G

These declarations, however, do not necessarily confirm the essentiality of a patent – they merely indicate that a participant believes their patent may be essential.

MAJOR SEP HOLDERS IN 5G GLOBALLY

The 5G SEP landscape is highly concentrated, with a handful of multinational corporations owning the majority of declared essential patents. According to IP analytics firms such as IPlytics and GreyB, the following are among the top 5G SEP holders:

- **Qualcomm (USA)**: A global leader in wireless technologies, particularly chipsets. Holds a substantial 5G SEP portfolio.



- **Huawei** (China): A leading contributor to 5G standardization and patent filings.
- **Samsung Electronics** (South Korea): Major innovator in mobile hardware and software.
- **Nokia** (Finland): Significant patent holdings in radio access and network protocols.
- **Ericsson** (Sweden): Among the earliest 5G technology developers; holds thousands of declared SEPs.
- **ZTE, LG, and Intel** are also prominent.

These entities typically earn substantial revenue through licensing programs, and in many cases, SEP licensing is a significant business model in itself (e.g., Qualcomm, Nokia).

ROLE OF STANDARD SETTING ORGANIZATIONS (SSOS)

SSOs are industry-driven bodies responsible for developing and maintaining technical standards. In the telecom sector, 3GPP coordinates the global specifications for mobile networks, which are adopted by ETSI and other regional bodies.

Key functions of SSOs in the SEP ecosystem:

- Facilitating consensus on technical standards involving multiple contributors.
- Receiving patent declarations from members regarding potential SEPs.
- Imposing FRAND obligations on members who wish to assert SEPs against implementers.

However, SSOs do not assess whether a declared SEP is *actually essential* nor do they monitor licensing terms. This leads to declaration inflation, where non-essential patents are sometimes declared, creating uncertainty and complexity for implementers like startups.

STRUCTURE OF LICENSING FRAMEWORKS

FRAND Licensing

SSO members are typically bound by FRAND commitments, which aim to:

- Ensure fair and equitable access to SEPs
- Prevent patent hold-up (where SEP owners exploit their position after a standard is widely adopted)
- Promote interoperability and open innovation

However, FRAND is not defined by statute in most jurisdictions (including India), leading to extensive litigation over:

- What constitutes a “fair” royalty rate



- What constitutes “non-discrimination” between licensees
- Whether injunctive relief is permissible for SEP holders

FRAND disputes have been the subject of numerous global legal battles, notably in *Huawei v. ZTE* (CJEU) and *Ericsson v. Xiaomi* (India).

Patent Pools

To reduce transactional complexity, patent pools aggregate SEPs from multiple owners and offer licenses as a bundle. Examples include:

- Avanci (for automotive applications of 4G/5G)
- Via Licensing and MPEG LA

While pools may simplify licensing, many 5G SEP holders (e.g., Qualcomm, Ericsson) prefer bilateral licensing for greater control and royalties. Patent pools are not widely used for general 5G technology licensing, particularly in telecom infrastructure, creating a fragmented licensing environment.

SEP CONCENTRATION AND BARRIERS FOR NEW ENTRANTS

The 5G SEP landscape is marked by extreme concentration, where over 80% of declared SEPs are owned by fewer than 10 entities. This creates the following barriers:

- **High licensing costs:** Startups lack the bargaining power to negotiate favorable FRAND terms.
- **Opaque pricing models:** No universal framework exists to determine “reasonable” royalty rates.
- **Litigation risk:** Small firms often face the threat of injunctions or lawsuits if they use SEPs without licenses.
- **Lack of patent portfolios:** Startups typically do not own countervailing patents, depriving them of leverage in cross-licensing.
- **Non-disclosure of licenses:** SEP agreements are often confidential, preventing benchmarking or informed negotiation.

For Indian startups, the combination of limited IP capacity, absence of institutional support, and regulatory ambiguity makes it particularly difficult to access SEPs without incurring prohibitive legal or financial risks.

THE INDIAN STARTUP LANDSCAPE IN 5G



GROWTH AND POTENTIAL

India hosts over 120,000 startups, with a growing segment engaged in telecommunications, IoT, and AI. The 5G rollout, initiated in 2022, has accelerated innovation in smart infrastructure, health tech, and industrial automation. Reports by NASSCOM and Invest India highlight that more than 300 deep-tech startups operate in domains aligned with 5G, positioning India as a potential global contributor. However, despite their technical capability, startups face significant constraints in accessing Standard Essential Patents (SEPs) necessary for interoperability and compliance, impeding their ability to commercialize 5G technologies independently.

NOTABLE INDIAN STARTUPS IN 5G

Promising Indian innovators include:

- Astrome Technologies – millimeter-wave wireless backhaul for rural 5G.
- Signalchip – developed India's first 5G chipset.
- Lekha Wireless, WiSig Networks, and Saankhya Labs – working on RAN solutions, SDR chipsets, and IoT stacks.
- Niral Networks – focused on open-source 5G core deployments.

While these startups demonstrate technological promise, they remain dependent on foreign technologies and face licensing hurdles for SEPs.

GOVERNMENT INITIATIVES

Key programs supporting 5G startups include:

- Digital India, Startup India, and Atmanirbhar Bharat
- PLI Scheme for Telecom and the 5G Test Bed (led by IITs)
- TSDSI – facilitating Indian participation in global standard-setting.

These initiatives foster R&D and manufacturing but do not directly resolve SEP access barriers, especially regarding licensing and legal support.

PERSISTENT GAPS

Despite strong policy intent, startups face:

- Limited R&D funding and weak academia-industry links.
- Lack of SEP licensing guidance, transparent royalty frameworks, or accessible patent pools.



- Regulatory voids, such as the absence of statutory FRAND provisions and no central SEP registry or institutional dispute resolution mechanism.

These gaps inhibit India's ambition to develop a self-reliant and globally competitive 5G ecosystem.

CHALLENGES FACED BY INDIAN STARTUPS IN ACCESSING SEPS

Startups form the foundation of a dynamic, innovation-driven economy. However, in the highly regulated and IP-intensive domain of 5G, Indian startups face formidable obstacles in accessing Standard Essential Patents (SEPs). These challenges are primarily legal, structural, and policy-related stemming from asymmetries in negotiation power, information access, and institutional support.

LICENSING COSTS AND NEGOTIATION POWER

One of the most significant barriers for Indian startups is the high cost of SEP licensing, which often includes upfront fees, per-unit royalties, and minimum revenue guarantees. Licensing negotiations are typically dominated by large SEP holders (e.g., Qualcomm, Nokia, Ericsson), who possess the legal and commercial leverage to dictate terms.

Startups, lacking countervailing IP portfolios and legal representation, are often compelled to either accept non-negotiable terms or risk patent infringement litigation. In practice, FRAND terms are rarely transparent or standardized, and royalty structures vary widely by region, device type, and commercial scale disadvantaging small-scale Indian entities.

LACK OF TRANSPARENCY IN SEP DECLARATIONS

SEP declarations to SSOs (such as ETSI or 3GPP) are not subject to independent verification of essentiality. This leads to:

- **Over-declaration** of non-essential patents by SEP holders, inflating their portfolios.
- **Absence of public licensing terms**, preventing benchmarking for startups.
- **Uncertainty about legal exposure**, since startups cannot easily determine which patents are truly essential to their product.

For Indian startups with limited legal resources, the absence of a **centralized, verified database** of SEPs significantly hampers compliance and risk assessment.



PATENT POOL ACCESSIBILITY AND COSTS

Patent pools (e.g., Avanci, Via Licensing) were developed to simplify SEP access through collective licensing. However, several challenges persist:

- Most 5G-relevant patent pools focus on automotive or IoT verticals, and telecom-specific solutions are fragmented.
- Not all major SEP holders participate in pools, forcing startups to engage in parallel bilateral negotiations.
- Licensing fees, even when aggregated, may still be unaffordable for early-stage startups.
- Lack of Indian representation in global patent pools or pool governance frameworks further limits influence or redressal.

Hence, while theoretically efficient, patent pools currently do not offer meaningful relief for Indian startups in the 5G ecosystem.

LIMITED LEGAL AND IP CAPACITY

Most Indian startups do not have in-house legal or IPR expertise, especially in navigating international patent licensing regimes. The following gaps are common:

- **Lack of patent literacy:** Founders may not fully understand the implications of SEP obligations.
- **No access to patent analysis tools** for claim mapping, essentiality checking, or portfolio evaluation.
- **Inadequate public support:** Government-backed IPR cells or startup incubators often do not provide SEP-specific legal assistance.

This absence of legal infrastructure amplifies startup vulnerability during negotiations or enforcement actions, and restricts their ability to enter standards-compliant product markets.

FRAND LICENSING DISPUTES AND LITIGATION RISKS

Global disputes over FRAND licensing are well documented. In India, too, litigation has become a tool of first resort for SEP holders. For instance:



- In *Ericsson v. Micromax* and *Ericsson v. Intex*, Indian companies faced injunctions and large royalty demands.
- Courts have granted interim injunctions in several SEP cases, exposing startups to immediate operational disruptions.
- The lack of clear Indian statutory guidance on FRAND royalty calculation or abuse of dominance in SEP enforcement contributes to judicial inconsistency.

Startups often lack the financial and legal strength to defend protracted litigation, resulting in forced settlements or market exit.

LACK OF GOVERNMENT SUPPORT AND POLICY DIRECTION

While the Indian government has introduced supportive initiatives for startups, there is no dedicated policy on SEP access for MSMEs or new entrants. Specific gaps include:

- No national FRAND licensing guideline, unlike some jurisdictions (e.g., EU, China).
- No startup-friendly patent licensing mechanism, like a compulsory licensing scheme tailored to SEPs.
- Weak regulatory intervention: Although the Competition Commission of India (CCI) has intervened in select cases, there is no ongoing oversight of SEP practices affecting startups.

A dedicated SEP framework that addresses the power imbalance in licensing is currently absent in India.

INTERNATIONAL JURISDICTION AND ENFORCEMENT BARRIERS

Since most SEP holders are foreign multinationals, Indian startups are often subject to:

- **Jurisdictional complexities**, including foreign court summons or arbitration clauses in distant venues.
- **Enforcement uncertainty**: Even where startups may challenge SEP validity or unfair licensing in India, SEP holders can initiate enforcement actions in Europe or the US, where litigation costs are prohibitively high.
- **Choice-of-law clauses** often disadvantage startups by placing them in legal environments with little familiarity or protection.



Moreover, India does not yet have reciprocal frameworks or bilateral patent enforcement treaties that could simplify dispute resolution for local innovators.

CASE STUDIES

Telefonaktiebolaget LM Ericsson v. Micromax Informatics Ltd.

- **Background:** Micromax, once one of India's top mobile handset manufacturers (and at its early stage, operating similarly to a tech startup), was sued by Ericsson in 2013 for alleged infringement of 8 SEPs related to 2G, 3G, and 4G technologies.
- **Key Legal Issue:** Ericsson sought an injunction and claimed that Micromax had failed to license SEPs under FRAND terms.
- **Outcome:** The Delhi High Court granted **interim relief** to Ericsson, directing Micromax to pay interim royalties. Later, the **Competition Commission of India (CCI)** opened an investigation, stating that Ericsson's licensing practices might be "prima facie discriminatory and excessive."
- **Relevance to Startups:** This case illustrated the **power imbalance** in FRAND negotiations and the lack of guidance on royalty benchmarking, which disproportionately affects small Indian companies that lack legal and financial firepower.

Telefonaktiebolaget LM Ericsson v. Intex Technologies (India) Ltd.

- **Background:** Ericsson sued Intex, another Indian mobile device manufacturer, in 2013, again alleging non-compliance with SEP licensing for GSM, EDGE, and UMTS standards.
- **Legal Proceedings:** Intex contested that Ericsson was abusing its dominant position and imposing discriminatory royalty rates.
- **CCI's Role:** The Competition Commission of India again intervened, launching an investigation under Section 4 of the Competition Act for abuse of dominance.
- **Findings:** Although the full case resolution took several years, it highlighted the lack of a **structured dispute resolution framework** for FRAND licensing in India, leaving startups and SMEs vulnerable to long, expensive legal processes.

CASE EXAMPLE (NON-LITIGATION): SIGNALCHIP TECHNOLOGIES

- **About:** Signalchip is a Bangalore-based semiconductor startup that gained national recognition in 2019 for developing India's first 5G modem chipset.



- **Relevance:** Though not publicly involved in SEP disputes, Signalchip's R&D-intensive model suggests the potential friction points that could arise if such startups move from R&D to commercialization and face SEP licensing demands.
- **Key Insight:** Signalchip has often highlighted the importance of indigenous IPR development to avoid dependence on foreign patents a position implicitly linked to the SEP access issue.

EMERGING POLICY-LINKED INSIGHTS

Although not tied to a specific company, several policy observations echo industry concerns raised by startups and SMEs:

- The TRAI 2017 Consultation Paper on Promoting Local Telecom Equipment Manufacturing raised concerns that SEP licensing can stifle domestic innovation unless addressed through balanced regulation.
- The TSDSI (Telecom Standards Development Society of India) has been actively promoting India-specific standards like 5Gi (now merged with 5G) to reduce SEP dependence, a move supported by domestic startups and academia.

These policy responses though indirect reflect the broader sentiment among Indian innovators regarding inequitable SEP ecosystems.

THEMATIC ANALYSIS FROM DOCTRINAL AND LEGAL REPORTS

Even in the absence of direct interview data, thematic insights can be extracted from legal rulings, government consultations, and academic analysis:

Theme	Findings from Documented Sources
<i>Licensing Power Imbalance</i>	Courts often grant injunctions that favor SEP holders; startups are rarely able to mount a full legal defense.



Theme	Findings from Documented Sources
<i>Opaque Royalty Structures</i>	No Indian precedent on how to calculate FRAND royalties. Rates vary and are typically confidential.
<i>Judicial Uncertainty</i>	SEP disputes are governed by general patent law and competition law, with no specific SEP statute or FRAND guidelines.
<i>Regulatory Gaps</i>	CCI intervention exists but lacks continuity; TRAI and DPIIT have not yet issued SEP-specific policy frameworks.
<i>Lack of Pool Participation</i>	Indian firms are mostly absent from international SEP pools, leading to negotiation asymmetries.

POLICY AND LEGAL FRAMEWORK IN INDIA

The legal and policy framework surrounding Standard Essential Patents (SEPs) in India remains fragmented and evolving, especially in the context of new technologies such as 5G. While India does not have a dedicated SEP statute or FRAND legislation, its broader intellectual property, competition, and telecom regulatory regimes interact to shape SEP accessibility — particularly for startups and new market entrants.

INDIAN PATENT LAW AND SEP ENFORCEMENT

India's patent law is governed by the Patents Act, 1970 (as amended), which provides the basis for recognizing and enforcing patent rights, including SEPs. Key features relevant to SEPs include:

- **No separate category for SEPs:** Indian law does not define SEPs or treat them differently from ordinary patents.



- **Patent enforcement mechanisms:** SEP holders can seek **injunctive relief** and damages under Sections 108 and 109 of the Patents Act.
- **Defenses against SEP abuse:**
 - Allegations of **misuse** or **unfair licensing practices** can be challenged using public interest considerations (Section 84, compulsory licensing).
 - Section 3(k) bars the patenting of mathematical and software algorithms *per se*, but this is not consistently applied in telecom SEP cases.

The Delhi High Court has adjudicated several SEP disputes (e.g., *Ericsson v. Micromax/Intex*), granting interim injunctions in favor of patent holders, indicating a pro-patentee approach in enforcement even in the absence of SEP-specific statutory guidance.

However, courts have often faced challenges in:

- Defining what constitutes “fair” and “reasonable” royalty under FRAND obligations.
- Determining whether injunctions should be granted when the licensee is willing to negotiate (as per international FRAND jurisprudence).

COMPETITION LAW AND ANTI-TRUST IMPLICATIONS

India’s Competition Act, 2002 provides a framework to address abuse of dominance in SEP licensing. The Competition Commission of India (CCI) has actively intervened in SEP cases, particularly where large SEP holders allegedly imposed discriminatory or excessive royalties.

Key legal principles:

- **Section 4** of the Competition Act prohibits abuse of dominant position, including:
 - Imposing unfair or discriminatory pricing conditions (including royalties).
 - Limiting or restricting market access, particularly relevant where SEP holders deny licenses to Indian firms.
- In *Ericsson v. Micromax* and *Ericsson v. Intex*, the CCI opened investigations into whether Ericsson’s SEP licensing violated competition norms.
- CCI observed that royalties based on the final product price (instead of the smallest saleable patent-practicing unit) could be discriminatory.

However, a legal vacuum still exists:



- No statutory FRAND definition under Indian competition law.
- CCI's authority to handle SEP-related disputes has been legally contested, especially where civil courts or the patent office have parallel jurisdiction.

ROLE OF TRAI, DOT, AND DPIIT IN REGULATING IP ACCESS

Several government agencies indirectly influence SEP governance through policy, standardization, and IP facilitation:

Telecom Regulatory Authority of India (TRAI)

- Issued consultation papers (notably in 2017) on the role of SEPs in telecom manufacturing.
- Emphasized the need for clear FRAND guidelines, government intervention in royalty benchmarking, and domestic participation in standardization.
- However, TRAI has no statutory authority to adjudicate SEP disputes.

Department of Telecommunications (DoT)

- Oversees telecom spectrum, licensing, and infrastructure.
- Has supported indigenous 5G testing through initiatives like the 5G Test Bed.
- Not directly involved in SEP licensing or enforcement but plays a policy-enabling role.

Department for Promotion of Industry and Internal Trade (DPIIT)

- Administers India's national IPR policy.
- Provides IPR facilitation schemes for startups, including cost reimbursement and fast-tracking.
- Has not yet issued SEP-specific guidance, though engaged in ongoing consultations with industry stakeholders.

Additionally, the Telecommunications Standards Development Society of India (TSDSI), while a non-governmental SSO, operates under government encouragement and seeks to promote India-specific standards (like 5Gi) to reduce dependence on foreign SEPs.

INTERNATIONAL OBLIGATIONS: TRIPS, WTO, AND BEYOND

India is a member of several international legal frameworks relevant to SEPs:



TRIPS Agreement (WTO)

- Sets global standards for IP protection, including patent rights.
- Article 31 allows for compulsory licensing under certain conditions, a tool India used in the pharmaceutical domain, but not yet tested for SEPs.
- TRIPS mandates non-discrimination between fields of technology, meaning telecom and software patents must also be enforced, subject to public interest safeguards.

Paris Convention & Patent Cooperation Treaty (PCT)

- India is a signatory, facilitating foreign patent filings and recognition.
- Relevant where Indian startups may be challenged in cross-border SEP litigation.

Bilateral FTAs (Proposed)

- Trade negotiations with the EU, USA, and UK often include IPR chapters that push for stronger SEP enforcement.
- These may eventually affect India's legal flexibility in regulating SEP licensing for SMEs.

COMPARATIVE ANALYSIS

A comparative understanding of how different jurisdictions approach SEP licensing particularly concerning startups and small enterprises offers valuable insight into potential regulatory reforms for India. This section reviews the SEP access frameworks in the **European Union, China**, and the **United States**, and evaluates the role of **patent pools** in improving access to essential technologies.

European Union

The European Union has developed a relatively structured legal framework for SEP licensing, especially following the landmark judgment in *Huawei v. ZTE* (CJEU, 2015). The decision established a protocol for enforcing SEPs, requiring SEP holders to offer licenses on FRAND terms before seeking injunctive relief. This ensures a balance between patent enforcement and fair access for implementers. Additionally, EU institutions such as the European Commission and EUIPO actively support transparency, royalty benchmarking, and SME participation in standardization, thereby reducing licensing asymmetries.

China

China has adopted a state-centric and court-driven approach to SEP licensing. Specialized IP courts in Beijing, Shanghai, and Guangzhou have issued critical rulings such as in *Huawei v. Conversant* emphasizing judicial royalty setting and rejecting injunctive relief when good-faith negotiations are ongoing. Furthermore, the Anti-Monopoly Guidelines on Intellectual Property Rights (2020) explicitly address FRAND licensing and SEP abuses. Government agencies such as SIPO and MIIT also provide legal and financial support to SMEs involved in patent-intensive sectors, reflecting a coordinated effort to protect domestic innovators.

United States

The United States does not have a codified FRAND licensing statute; instead, SEP enforcement is governed by a mix of contract law and antitrust jurisprudence. While some courts have limited injunctive relief in FRAND-related cases (e.g., *FTC v. Qualcomm*), others have upheld the rights of SEP holders. The regulatory divide between the DOJ and FTC on SEP policy further complicates the landscape. Startups receive minimal institutional assistance in licensing negotiations, leaving them reliant on costly litigation or private negotiation tools.

Patent Pools and Licensing Models

Patent pools such as Avanci, Via Licensing, and MPEG LA offer bundled access to SEPs from multiple holders. While these pools aim to reduce transaction costs and enhance accessibility, their utility for startups remains limited. Major SEP holders like Qualcomm and Apple often opt out, and licensing fees are frequently non-transparent. Moreover, most pools are vertical-specific (e.g., automotive or multimedia), leaving general telecom startups to negotiate directly with individual patent holders. India currently lacks participation in or development of domestic SEP pools.

Compared to the EU and China, *India lacks a cohesive SEP access strategy*. The absence of judicial guidelines, regulatory oversight, and startup-focused support mechanisms places Indian innovators at a systemic disadvantage. Learning from these global models, India can develop a balanced SEP framework that integrates legal safeguards, institutional mediation, and collective licensing options tailored to the needs of its startup ecosystem.

RECOMMENDATIONS



To address the structural, legal, and institutional barriers that Indian startups face in accessing Standard Essential Patents (SEPs) in the 5G domain, the following recommendations are proposed. These suggestions are grounded in doctrinal analysis and comparative policy insights, aiming to create a balanced and innovation-friendly SEP ecosystem in India.

Codification of FRAND Licensing Principles

There is a pressing need to codify FRAND (Fair, Reasonable, and Non-Discriminatory) licensing obligations within Indian law. This could be achieved through amendments to the *Patents Act, 1970* or *Competition Act, 2002*, providing statutory clarity on what constitutes fair royalty practices, non-discrimination, and injunctive relief in SEP disputes. Such codification would ensure greater predictability and fairness in licensing arrangements.

Establishment of a National SEP Licensing and Mediation Mechanism

A central, neutral authority possibly under the aegis of the Department for Promotion of Industry and Internal Trade (DPIIT) or the Telecom Regulatory Authority of India (TRAI) should be created to mediate SEP licensing disputes. This body should facilitate licensing negotiations, issue non-binding royalty benchmarks, and offer template licensing agreements, particularly to support startups and MSMEs that lack the legal capacity to engage with large SEP holders.

Regulatory Oversight by CCI and TRAI

The Competition Commission of India (CCI) should continue to play an active role in monitoring and addressing anti-competitive licensing practices by dominant SEP holders. In parallel, TRAI should be empowered to issue guidelines on SEP licensing, especially concerning transparency in pricing and access for new market entrants.

Creation of a SEP Legal Aid and Support Platform

A dedicated SEP legal support unit should be launched under existing government initiatives like Startup India. This unit should provide advisory services, access to SEP declarations and databases, licensing templates, and awareness programs on FRAND compliance and international standard-setting procedures.

Promotion of Indian Participation in International SSOs



The government should incentivize and support Indian startups, research institutions, and telecom innovators to actively participate in global Standard Setting Organizations (SSOs) such as ETSI, 3GPP, and IEEE. Greater participation would allow Indian entities to influence standard development, enhance early-stage SEP awareness, and reduce downstream licensing friction.

Development of Indian Patent Pools or Open Licensing Platforms

Establishing a domestic SEP licensing pool or open platform would help aggregate patent access for startups and reduce transactional complexity. Such a pool could be supported by public institutions or industry consortia and serve as a model for transparent and accessible licensing of core technologies.

Encouragement of Indigenous Standard Development

India should continue investing in the development of indigenous standards (e.g., the 5Gi initiative) that reflect local technological needs while reducing dependency on foreign SEPs. Startups contributing to such initiatives should receive R&D grants and regulatory incentives.

Introduction of Financial Assistance Mechanisms for SEP Licensing

Finally, the government should consider launching royalty subsidy schemes, IP insurance programs, or co-financing models for SEP licensing fees. These would provide much-needed financial relief for early-stage startups and help mitigate the risk of exclusion from standards-based markets due to cost barriers.

CONCLUSION

This study has critically examined the structural, legal, and policy challenges that Indian startups face in accessing Standard Essential Patents (SEPs) required for 5G technology deployment and compliance. The 5G SEP ecosystem is dominated by a handful of global patent holders, making it highly exclusionary for new and small entrants. Licensing frameworks lack transparency, with FRAND (Fair, Reasonable and Non-Discriminatory) terms often undefined, unmonitored, and inconsistently enforced. Indian startups suffer from limited legal capacity, lack of representation in international standard-setting bodies, and absence of negotiation power during SEP licensing. There is no unified legal or policy framework in India to regulate SEP licensing or protect startups from potential abuse of dominance. Comparative legal systems, such as those in the EU and China, demonstrate stronger



institutional mechanisms and startup-focused interventions to balance SEP enforcement and innovation. This research contributes to the existing literature by providing a doctrinal and comparative analysis of SEP access within the context of India's startup ecosystem and 5G development. It also highlights a significant policy vacuum in India with respect to FRAND licensing, SEP litigation, and SME-oriented legal protections in the IPR ecosystem. This study also underscores the need for multi-agency coordination between the DPIIT, TRAI, CCI, and DoT to create a cohesive national SEP policy aligned with India's digital transformation goals.



CHAPTER 24

ROYALTIES, RIGHTS AND REGULATION: DECODING PATENT POOLS IN THE HIGH-STAKES GLOBAL INNOVATION RACE

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ABSTRACT

Today's contemporary innovation led global era brings a whole host of technical, socio-economic and legal complexities. The rapid rise in quantum of innovations has led to formidable growth in the aggregation of intellectual property rights. Moreover, registration of patents, which is a direct consequence of growth of innovations, is not as basic as it appears. Quite a few loopholes such as licensing complexities, high transaction costs and concerns over fair market competition have been plaguing the same. In recent times, patent pools have had a significant contribution in enhancing technological diffusion in various economies. This article aims to underscore the operationalisation of patent pools while also illuminating the regulatory frameworks governing the same. Additionally, this article also touches upon the rights of parties and determination of royalties in a patent pool while also highlighting the role that patent pools do and ought to play in developing economies while taking into consideration the amplification of innovations in the future. Furthermore, this article focuses on some crucial research questions. Firstly, what are the primary regulatory mechanisms governing patent pools and licensing models on both, the national as well as global levels, and how can they help in maintaining the pool's viability? Secondly, how does the determination of royalties' distribution model take place and what consequences does it hold for the stakeholders? Finally, what is the impact of antitrust regulations on the operationalisation of patent pools? This article adopts a doctrinal and qualitative research methodology complemented with a case study based approach while also placing emphasis on existing regulations and statutes. Lastly, this research will also depend on a policy analysis of the proposed measures.

KEYWORDS: Regulatory Frameworks, Royalty Model Determination, Antitrust Regulations, Technological Diffusion, Developing Economies

INTRODUCTION

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Some of the world's leading companies spend a huge portion of their available corpus on expenses such as patent royalties and patent litigations throughout the world. Quite a few times, these expenses by the companies that facilitate protection of their intellectual property rights exceed the total amount of money they spend on research and development. For instance, in 2012, two multinational giants viz. Google and Apple faced staggering backlash worldwide after certain sensitive reports claimed that their expenses on patent litigations and acquisitions were higher as compared to their expenses on business expansion, research and development ("R&D") which, consequently, diminished trust of certain consumers in their products.⁷²⁰ Furthermore, the world has witnessed a huge rise in filing of patents by numerous entities of varying nature. These patents have both, hindered as well as provided a massive boost to technological and non-technological innovations globally. Considering the positive role that patents have played in innovations, they provide exclusive rights to entities over their innovations which, in turn, encourage and incentivise other groups to facilitate better innovations in the future.

Patents help in giving all the R&D of a company a direction such that it protects their product ideas from infringement and duplication by competitors in the open market. Furthermore, such companies can also earn back some or a major portion of their high R&D costs from the income they receive through patent royalties.⁷²¹ Basic guarantee of intellectual property rights helps any company realise their complete potential and achieve their maximum output since they have no fear of any kind of duplication or stealing of their 'original idea'. However, like every coin has two sides, patents also have certain limiting factors which prove to be significant obstacles in innovations throughout the world. Firstly, the entire process of patent filing and registration is way too time consuming and at the same time, extremely costly. In addition to this, patents which may be excessively general may hamper good competition in the market leading to unfair monopoly, reduced innovations and limited choices for end consumers. This may also pose a significant barrier for new companies who wish to enter the market.⁷²² Thus, there are quite a few of these issues and some of these can be effectively addressed with the increased operationalisation of something known as 'patent pools'. To be precise, according to the Secretariat of the 'World Intellectual Property Organisation' ("WIPO"), "Patent pools can be defined as an agreement between two or more patent owners to license one or more of their patents to one another or to third parties."⁷²³ These patent pools prove to be a massive advantage such that they streamline the entire complex licensing process by helping companies avoid indulging in multiple patent negotiations with different

⁷²⁰ Brian J. Love, Apple, Google – Please Spend on R&D Not IP, San Francisco Chronicle, August 22, 2012.

⁷²¹ *How Do Patents Act as an Incentive to Technological Innovation?* | Cypris, <https://www.cypris.ai/insights/how-do-patents-act-as-an-incentive-to-technological-innovation> (last visited Aug. 8, 2025).

⁷²² *Id.*

⁷²³ World Intellectual Property Organisation Secretariat, Patent Pools and Antitrust- A Comparative Analysis (Mar. 2014), https://www.wipo.int/documents/743993/747687/patent_pools_report.pdf/8690993c-639b-d12d-eb8f-fff1125cf13f?version=1.2&t=1671199878003



entities for a single innovation and such companies may create a bundled license through the formation of a patent pool. This helps in avoiding a phenomenon viz. ‘patent thicket’ which may be defined as “A dense web of overlapping intellectual property rights that a company must hack its way through in order to actually commercialise new technology.”⁷²⁴ Furthermore, this also helps in toning down the high transaction and operational costs involved in the process. Lastly, the ‘tragedy of anti-commons’ has been a major barrier in the growth of innovations.⁷²⁵ This can be tackled through patent pools because these would help in avoiding situations wherein too many patents would reduce the scope of innovation.

SHEDDING LIGHT ON PATENT POOLS: SOLVING THE PUZZLE

As aforementioned, patent pools have been clearly defined by the WIPO.⁷²⁶ Generally, patent pools play a crucial role in situations wherein multiple patents including various technologies are integrated. Herein, as far as the functioning of a patent pool is concerned, it begins with the formation of a pool including multiple patent holders and the patents within this pool become available to licensees which may include both, members as well as non-members. Now, a portion of the total amount these pools earn through licensing fee is proportionally divided among the members based on the value of patents they hold.⁷²⁷ Furthermore, there are certain categories based on which patent pools are classified. Primarily, they are grouped into open and closed patent pools. While the former refers to one wherein allocation of patents in the pool is outsourced to an external entity, the latter refers to a pool wherein one of the members controls allocation of patents based on a licensing fee.⁷²⁸ Both of these patent pools hold their own significance in the IP landscape such that acquiring membership of a particular pool depends on the nature of the entity seeking the same and ultimately, joining any of these simplifies the protection of IP rights of these companies. In addition to this, another classification divides patent pools into standard essential patent pools and non-standard pools. In standard essential pools, patents are required to comply with certain technological or related industry standards while there is no such requirement in place for non-standard pools.⁷²⁹

⁷²⁴ *What Is Patent Thickets - An Analysis*, <https://www.globalpatentfiling.com/blog/examining-various-dimensions-patent-thickets> (last visited Aug. 8, 2025).

⁷²⁵ Michael Heller, *The Tragedy of the Anticommons: A Concise Introduction and Lexicon*, 76 MOD. L. REV. 6 (2013)

⁷²⁶ WIPO Secretariat, *supra* note 4, at 3.

⁷²⁷ Robert P. Merges, *Institutions for Intellectual Property Transactions: The Case of Patent Pools*, in *EXPANDING THE BOUNDARIES OF INTELLECTUAL PROPERTY: INNOVATION POLICY FOR THE KNOWLEDGE SOCIETY* 123, 129 (Rochelle Cooper Dreyfuss et al. eds., 2001)

⁷²⁸ PatSeer, *All About Patent Pools – What You Need to Know*, PATSEER (Feb. 13, 2023), <https://patseer.com/all-about-patent-pools-what-you-need-to-know/>.

⁷²⁹ *A Closer Look at Patent Pools amid India’s Growing Prominence on the Global Monetisation Stage*, <https://www.worldtrademarkreview.com/guide/india-managing-the-ip-lifecycle/2025/article/closer-look-patent-pools-amid-indias-growing-prominence-the-global-monetisation-stage> (last visited Aug. 8, 2025).



As the concept itself suggests, patent pools are quite complex in nature since there are multiple players directly involved in their operationalisation. Firstly, patent holders (also termed as ‘licensors’) are the main players herein. The main roles performed by them include the collection of royalties they receive upon licensing their patent pool to any third party and the supervision of the entire pool. They have various other benefits and motivations to be part of such pools apart from cost cutting and simplicity. Through this, these entities save a lot of their time, capital and energy which they use in dealing with third-party licensees on an individual level. Some of the other benefits reaped by the patent holders within a pool include increased access to essential and futuristic technologies, collaborations and network building in their respective industry and reduced risks of unnecessary IP litigations.⁷³⁰ Secondly, licensees are the entities which pay royalties to the patent holders in return of a single uniform license to the patents under the pool. These licensees have certain market benefits such that they have simple access to complex technologies furthering innovation drive.⁷³¹ This is crucial in the sense that it saves transaction costs of third-party companies which, in turn, leads to better productivity. Herein, there is also a concept of cross-licensing wherein two or more licensors exchange their patents with each other to meet production requirements and this process, generally, takes place within a patent pool.⁷³² Lastly, patent pool administrators are independent entities which play a significant role within the pool in facilitating the pool’s management while overseeing its operations.⁷³³ These are also concerned with collection and distribution of royalties among the licensors, ensuring compliance with the ‘Fair, Reasonable and Non-Discriminatory’ (‘FRAND’) regulations.⁷³⁴ The neutral administrators’ functioning leads to overall governance structure of patent pools remaining quite collective in nature since these administrators uniformly deal with various managerial and supervisory functions they are entrusted with.

In addition to this, there are quite a few case studies which demonstrate that while patent pools have been quite successful, there also seems to be a requirement to make deliberations over certain prevailing shortcomings within the patent ecosystem, which ought to be rectified to make the IP market more accessible, non-complex and an aid for futuristic innovations. There have been mixed outcomes as far as the success or failure of patent pools is concerned. Firstly, considering the example of a successful patent pool, it is pertinent to highlight the ‘Moving Pictures Experts Group’ (‘MPEG’) patent pool which was managed by the MPEG license

⁷³⁰ *Leveraging Patent Pools for Innovation and Collaboration*, (Jun. 19, 2024),

<https://depenning.com/blog/leveraging-patent-pools-for-collaboration-and-innovation/>.

⁷³¹ S. A. Law Offices-Suchi Rai & Shrimant Singh, *Patent Pools in India*, LEXOLOGY (Dec. 18, 2023),

<https://www.lexology.com/library/detail.aspx?g=6a730147-4bb0-4d8e-b579-90c294a39d15>.

⁷³² Jay Pil Choi, *Patent Pools and Cross-Licensing in the Shadow of Patent Litigation*, 51 Int’l Econ. Rev. 441 (2010)

⁷³³ Pooyan Khashabi, *Inefficiencies in Essential Patent Pool Formation Are Pool Administrators also involved?*, SSRN Electronic Journal (May 3, 2018), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3163726

⁷³⁴ Id.



administrator (“MPEG-LA”), and the group consists of around 11 patent pools within its ambit.⁷³⁵ The MPEG-LA is now a part of the ‘Via Licensing Alliance’ as a result of its merger with another patent pool, viz. ‘Via Licensing’.⁷³⁶ The MPEG patent pool is responsible to its licensees and licensors who have their work dependent upon MPEG video standards which relate to video and audio transmission and compression. It is considered one of the most successful pools due to certain factors such that its formation has helped in reduction of patent litigation in the audio-video compression industry, simplification of licensing and royalties’ payment processes, widespread adoption of such technologies globally because of easy access to patenting licenses and rapid development in the industry.⁷³⁷ Furthermore, certain patent pools have had mixed reactions as far as their response in the general market is concerned. One of the examples of this situation is the DVD6C patent pool which is quite closely related to the MPEG pool since while the latter primarily deals with audio and video encoding, the former is wider in ambit because along with audio-video compression and transmission, it specifically deals with the hardware aspects of DVDs in the industry. The DVD6C has overcome quite a major challenge in paving its path towards becoming a successful patent pool. For instance, one of its major issues related to the determination and distribution of royalties within the pool licensors and it was rectified by the pool administrators through the development of such a methodology which distributed royalties between the shareholders based on the value and usage of each entity.⁷³⁸

In addition to this, a major development in the arena of global patent pools is related to the joint initiative of the World Health Organisation (“WHO”) and Costa Rica known as the ‘COVID-19 Technology Access Pool’ (“C-TAP”) which is a global uniform platform for worldwide makers and inventors of the ‘COVID-19’ vaccines and other medical tools to facilitate hassle free access to intellectual property rights, especially patents, for other entities.⁷³⁹ This proved to be a timely and life-saving initiative since it not only quickened the vaccine manufacturing process, but it also saved a millions of lives in the process since certain technologically backward countries with limited amount of expertise could borrow both, ideas and innovation techniques from the developed world who already had a substantial amount of knowledge. Lastly, while it is true that most patent pools have produced significant positive results, some have also failed miserably. One such instance relates to

⁷³⁵ Yunsheng Zhang, Chen Peng & Oluwolenurudeen Omonijo, *Patent Pool and Dominant Design: An Empirical Study of Patent Pool from MPEG-LA*, 74 JOURNAL OF ENGINEERING AND TECHNOLOGY MANAGEMENT 101847 (2024).

⁷³⁶ Rani Mehta, *Via Licensing Combines with MPEG LA*, MIP (May 2, 2023), <https://www.managingip.com/article/2blvv66hhham3if5y46io/via-licensing-combines-with-mpeg-la>.

⁷³⁷ Cristina Baltes, *Patent Pools- An Effective Instrument for the High Technology Co-operation?* (Lund Univ. Faculty of Law Master of European Affairs thesis, 2003), <https://lup.lub.lu.se/student-papers/record/1554688/file/1563410>

⁷³⁸ @PatentPC, *The Role of Patent Pools in Commercialization*, PATENTPC (Jul. 24, 2025), <https://patentpc.com/blog/the-role-of-patent-pools-in-commercialization>.

⁷³⁹ *COVID-19 Technology Access Pool*, <https://www.who.int/initiatives/covid-19-technology-access-pool> (last visited Aug. 8, 2025).



the 2008 initiative of the International Business Machines (“IBM”) Corporation which was known as the Eco-Patent Commons (“Commons”). This was a kind of patent pool consisting of patents relating to green technology wherein various entities from different parts of the Globe interacted on a uniform platform to create a cohesive pool comprising of patents relating to specific technologies such as recyclability of waste products, energy conservation and pollution control methods and in totality, this pool included approximately two hundred and forty-eight patents.⁷⁴⁰ However, there were quite a few reasons due to which this pool turned out to be a massive disappointment and finally ceased operating in 2016.⁷⁴¹ Some of the major reasons behind the same were as follows-

- i. A lack of knowledge with the patent holders regarding what exactly was desired by the entities and end consumers in the market,
- ii. shortage of avenues required for publicity of the pool to spread greater awareness which also resulted in lesser benefits for the licensors and finally,
- iii. since the patent pool functioned voluntarily, lack of funds also proved to be a major impediment in overall functioning.

THE REGULATORY LABYRINTH: DECODING GLOBAL REGULATIONS

Patent pools are a crucial concept in the intellectual property rights regime and must be regulated systematically to avoid practices such as royalty stacking which refers to the unfair burdening of royalties over the licensees by the licensors wherein each of them demands individual royalties on their patents leading to a kind of unfair monopoly.⁷⁴² Hence, certain regulatory mechanisms are in place all over the Globe to ensure legal compliance by patent pools. Primarily, the World Trade Organisation’s (“WTO”) significant agreement viz. ‘Trade Related Aspects of Intellectual Property Rights’ (“TRIPS”) has been behind the setting of certain bare minimum standards to ensure patent enforcement as well as protection and the same has had influence over national laws worldwide.⁷⁴³ Furthermore, patent pools are also subject to regulation by antitrust authorities due to their direct impact on market conditions, market competition and anti-competitive practices. In terms of global regulation, WIPO does not have a specific framework with respect to patent pools, but it serves as a global platform for engaging discussions on concepts like standard-essential patents which happen to form a key part as well as the

⁷⁴⁰ *The Infamous Failure of the Eco-Patent Commons* – *Vermont Journal of Environmental Law*, <https://vjel.vermontlaw.edu/ecoperspectives-blog/2021/05/the-infamous-failure-of-the-eco-patent-commons/> (last visited Aug. 8, 2025).

⁷⁴¹ *Id.*

⁷⁴² Jonas C. Bjørner & Bertil Tungodden, Classroom Experiments on Technology Licensing: Royalty Stacking, Cross-Licensing and Patent Pools, (NHH Dep't of Bus. & Mgmt. Sci. Discussion Paper No. 3/2021, Feb. 2021), <https://openaccess.nhh.no/nhh-xmlui/handle/11250/2727395>

⁷⁴³ *Patent Polling and Cross- Licensing – A Double-Edged Sword*, <https://www.globalpatentfiling.com/blog/Patent-Polling-and-Cross--Licensing-A-double-edged-sword> (last visited Aug. 8, 2025).



basis of the majority of patent pools.⁷⁴⁴ Also, WIPO deals with the intermingling of intellectual property rights and competitive market policies on a global scale.⁷⁴⁵ This somewhat impacts the regulation of patents as well as their standardization within the pools. Pertinently, the TRIPS agreement of the WTO does have certain implications over operationalization of patent pools. The TRIPS, quite significantly, advocates for robust protection of medical and pharmaceutical patents.⁷⁴⁶ However, this stance of the TRIPS came under a lot of skepticism from international experts as they felt that such provisions were overly favourable towards the developed economies who controlled around 80% of the world's drug patents.⁷⁴⁷ The scope of patents to be included within various pools has also been discussed under the TRIPS agreement. Article 27 of the agreement quite rightly lays down that member countries are obligated to make patents available for all kinds of technological products and processes subject to the tests of novelty, industrial applicability and inclusion of an inventive step.⁷⁴⁸ Quite importantly, the implications of TRIPS rely upon the question as to whether the licenses and the pool, in itself, are voluntary or involuntary. Herein, Article 28 sets out conditions for voluntary patent licenses.⁷⁴⁹ Article 31 deals with involuntary patent licenses and mandates that the licensors (patent holders) must be adequately remunerated in these cases.⁷⁵⁰ Lastly, as far as TRIPS is concerned, Article 40 deals with anti-competitive practices which are against the basic notion of patent pools' efficient and economic functioning.⁷⁵¹ Thus, while WIPO and TRIPS are crucial in controlling global patent pools, regional laws also pretty much deal with everything under their ambit.

In furtherance, as far as national regulatory mechanisms are concerned, patent pools are mostly subject to anti-trust regulations of countries due to the significant impact they have on market competition dynamics. To begin with the United States of America ("USA"), guidelines issued by the Department of Justice ("DOJ") and Federal Trade Commission ensure that agreements under the pool are legally complied with and have no anti-market and anti-competitive elements.⁷⁵² These pools fall under the strict scrutiny of anti-trust laws of the USA

⁷⁴⁴ *Standard Essential Patents*, <https://www.wipo.int/en/web/patents/topics/sep> (last visited Aug. 8, 2025).

⁷⁴⁵ *Intellectual Property and Competition Policy*, COMPETITION-POLICY, <https://www.wipo.int/web/competition-policy> (last visited Aug. 8, 2025).

⁷⁴⁶ Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, 1867 U.N.T.S. 154 (1994), 33 I.L.M. 1144 (1994)

⁷⁴⁷ Peter Drahos and John Braithwaite, *Intellectual Property, Corporate Strategy, Globalization: TRIPS in Context*, 20 Wis. Int'l L.J. 451 (2001).

⁷⁴⁸ Agreement on Trade-Related Aspects of Intellectual Property Rights, art. 27(1), Apr. 15, 1994, 1867 U.N.T.S. 154 (1994)

⁷⁴⁹ Agreement on Trade-Related Aspects of Intellectual Property Rights, art. 28, Apr. 15, 1994, 1867 U.N.T.S. 154 (1994)

⁷⁵⁰ Agreement on Trade-Related Aspects of Intellectual Property Rights, art. 31, Apr. 15, 1994, 1867 U.N.T.S. 154 (1994)

⁷⁵¹ Agreement on Trade-Related Aspects of Intellectual Property Rights, art. 40, Apr. 15, 1994, 1867 U.N.T.S. 154 (1994)

⁷⁵² WIPO Secretariat, *supra* note 4, at 3.



viz. the Sherman Act⁷⁵³ and the Clayton Act⁷⁵⁴. However, these guidelines very briefly address patent pools and mainly deal with independent patents. As per the ‘Antitrust Guidelines for the Licensing of Intellectual Property’, patent pools are pro-competitive in circumstances wherein they result in reduction of transaction cost, promotion in technological dissemination, avoidance of costly IP infringement litigation etc.⁷⁵⁵ Also, certain other guidelines by the DOJ lay down the basic principles required for analysis of patent pools under anti-competitive laws such that the royalties should be reasonable, the pool should be for a limited duration, patents must be valid and not past their expiry, the licensees should have certain basic rights like the development of patents.⁷⁵⁶

Furthermore, in the European Union, the ‘European Commission’ (“EC”) had taken into account the DVD standardization case and therein, it was of the view that the patent pool led to the efficient introduction of DVDs as a result of the techno-economic progress and also observed that the pool comprised of patents which were essential while the agreement based on licensing terms was inclined towards a ‘non-discriminatory and a non-exclusive license’.⁷⁵⁷ In the European Union, the Technology Transfer Regulation is the main instrument to govern patent pools.⁷⁵⁸ As per the same, patent pools are strictly scrutinized under competition laws and don’t get a direct safe harbour under the same and these are analysed by the Technology Transfer Guidelines.⁷⁵⁹ Also, any kind of exemption under Article 101 of the ‘Treaty on the Functioning of the European Union’ (“TFEU”), which prohibits agreements restricting fair competition, is not automatically available to patent pools.⁷⁶⁰ However, the Regulation is not overly rigid and does grant certain ‘block exemptions’ to some of the technological agreements subject to the condition that the companies involved in these kind of licensing agreements have a market share of less than 20% but, these exemptions do not cover the whole patent pools within their ambit.⁷⁶¹ Quite interestingly, though, these exemptions may apply to individual licenses within the pool.⁷⁶²

⁷⁵³ Sherman Antitrust Act, 15 U.S.C. §§ 1-7 (2018)

⁷⁵⁴ Clayton Antitrust Act, 15 U.S.C. §§ 12-27 (2018)

⁷⁵⁵ WIPO Secretariat, *supra* note 4.

⁷⁵⁶ Richard J. Gilbert, *Antitrust for Patent Pools: A Century of Policy Evolution*, 2004 Stan. Tech. L. Rev. 3 (2004).

⁷⁵⁷ COMMISSION PRESS RELEASE IP/00/1135, Oct. 9, 2000, https://ec.europa.eu/commission/presscorner/detail/en/ip_00_1135

⁷⁵⁸ Commission regulation (EC) No 772/2004 of 27 April 2004 on the application of Article 81(3) of the Treaty to categories of technology transfer agreements,

<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32004R0772:EN:HTML>

⁷⁵⁹ COMMISSION NOTICE, *Guidelines on the application of Article 81 of the EC Treaty to technology transfer agreements*, 2004 O.J. (C 101) 2 (Apr. 27, 2004).

⁷⁶⁰ Treaty on the Functioning of the European Union art. 101, Oct. 26, 2012, 2012 O.J. (C 326) 47

⁷⁶¹ WIPO Secretariat, *supra* note 4.

⁷⁶² *Id.*



In addition to this, India also has certain regulatory mechanisms of its own that oversee the operationalization and legal compliance of patent pools. Primarily, two statutes viz. the Patents Act, 1970⁷⁶³ and the Competition Act, 2002⁷⁶⁴ govern the same. While the Patents Act, 1970 does not explicitly provide for the supervision of patent pools, it does contain certain provisions which are to be applied in the incorporation of such pools. For instance, Section 68 provides for the patent licensing wherein there is a prerequisite that all terms of the agreement must be signed by both the parties.⁷⁶⁵ Also, Section 69 solidifies the aforementioned provision by requiring that the agreements be included in the patent register.⁷⁶⁶ Section 84 of the said Act allows compulsory licensing subject to a condition, and all of these provisions when read in consonance with each other, conceptualize a patent pool.⁷⁶⁷ Lastly, as far as the Competition Act, 2002 is concerned, Section 3 of the said Act deals with anti-competitive agreements and the same can be enforced in the case of a patent when the licensors misuse their dominant position within the pool and impose unreasonable conditions, thus limiting market competition.⁷⁶⁸

DECODING VALUE: SHEDDING LIGHT ON ROYALTY DISTRIBUTION STRUCTURE

There are various types of methodologies which are used in the determination and calculation of royalties in a patent pool. One of the most common techniques used is the ‘royalty percentage’ method wherein the royalties are determined on the basis of a particular portion of the revenue earned upon the exploitation of the licensor’s patent.⁷⁶⁹ This is similar to another method known as the ‘per-unit method’ wherein royalty is collected in the form of a fee on the sale of every product created through the licensed patent. Some of the other royalty determination methods include lump sum payment and periodic instalments.⁷⁷⁰ Furthermore, the ‘Technical Contribution Assessment Model’ is also used in the determination of the rate of royalties. Herein, the evaluation system considers several patent parameters including technological value and contribution to the pool, areas of application, target, overall business valuation etc. to determine the royalty which is to be paid for the particular patent.⁷⁷¹ Another concept is a part of this model viz. the essentiality assessment, as per which the standard essential patents (“SEP”) are taken into consideration based on their role in the implementation of a

⁷⁶³ Patents Act, 1970, No. 39, Acts of Parliament, 1970 (India)

⁷⁶⁴ Competition Act, 2002, No. 12, Acts of Parliament, 2003 (India)

⁷⁶⁵ Patents Act, 1970, No. 39, Acts of Parliament, 1970, § 68 (India)

⁷⁶⁶ Patents Act, 1970, No. 39, Acts of Parliament, 1970, § 69 (India)

⁷⁶⁷ Patents Act, 1970, No. 39, Acts of Parliament, 1970, § 84 (India)

⁷⁶⁸ Competition Act, 2002, No. 12, Acts of Parliament, 2003, § 3 (India)

⁷⁶⁹ *How Royalties Are Calculated - RoyaltyRange*, <https://www.royaltyrange.com/resources/how-royalties-are-calculated/> (last visited Aug. 8, 2025).

⁷⁷⁰ *Royalty Rate: How Are Royalties Calculated?*, <https://tipalti.com/resources/learn/royalty-rate/> (last visited Aug. 8, 2025).

⁷⁷¹ *Patentability Evaluation in IP Automation*, <https://xray.greyb.com/intellectual-property/patentability-assessments> (last visited Aug. 8, 2025).



standard.⁷⁷² This is one of the most preferred models since it considers the contribution of the patents and the patent holders to decide the rate of royalty a licensor is entitled to receive. This leads to a motivating factor for other holders to utilize and develop their patents effectively to boost their contribution in the market which would, in turn, have a positive effect on the value of their patent, thus earning them greater royalties. However, one of the downsides of the given model is that while it leans a bit in favour of the technologically stronger entities, it disincentivizes the smaller ones to go for innovation projects of a greater magnitude since they feel it will be a high investment with very low returns. In addition to this, another method of royalty determination is based on the market evaluation. Herein, the value of patents' royalties is determined based on market trends and conditions and this is done through a comparative analysis between the prices of the patents with other similar kinds of patents issued in the past while also taking into account certain other factors.⁷⁷³ One of the most crucial advantages of this model is that it takes into consideration the ups and downs of the market as per evolving times. However, it is also criticized at times since the market tends to be extremely volatile in certain rare cases like wars and famines and in these situations, determination of royalties is very complex and leads to IP disputes. Lastly, the cost-based method is also considered wherein, the value of the royalties depends upon the overall costs incurred in the making and operationalizing of the patent.⁷⁷⁴ One of the advantages herein is that it helps the entities recover their costs, giving them a greater incentive to finance better innovation projects in the future. However, one major shortcoming herein is that it pays absolutely no heed to market conditions.

Moving ahead, as far as distribution mechanisms of royalties within the patent pool are considered, there are two most basic approaches. The proportional distribution of royalties primarily depends on the quality/quantity of patents contributed by the licensors.⁷⁷⁵ Herein, the most important advantage relates to that of incentives to create better technologies and innovations while the downside of the same pertains to complexity in the determination of what standard should be set as a 'good quality' and 'bad quality' patent. Furthermore, the usage-based model determines distribution of a particular patent's royalty depending upon the frequency of usage of the said patent by the licensee.⁷⁷⁶ This model takes into consideration the market conditions because it ascertains the usability of said patent in current market conditions. However, this also leaves a scope for misappropriation while also leading to very high monitoring costs. Finally, there are certain models that are a

⁷⁷² Justus Baron, *Counting standard contributions to measure the value of patent portfolios – A tale of apples and oranges*, 44 Telecomm. Pol'y 101870 (2020)

⁷⁷³ *How to Use Market-Based Approaches in Patent Valuation* | Eqvista, <https://eqvista.com/intangible-asset-valuation/approaches-patent-valuation/> (last visited Aug. 8, 2025).

⁷⁷⁴ *IP Valuation Methods - RoyaltyRange*, <https://www.royaltyrange.com/resources/ip-valuation-methods/> (last visited Aug. 8, 2025).

⁷⁷⁵ Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, in 1 *Innovation Policy and the Economy* 119, 150 (Adam B. Jaffe, Josh Lerner & Scott Stern eds., 2001).

⁷⁷⁶ Josh Lerner & Jean Tirole, *Efficient Patent Pools*, 94 Am. Econ. Rev. 691 (2004).



combination of certain other models, and these are known as the hybrid models. While these come with a degree of flexibility and market adaptability, they are also prone to a lot of complexities.⁷⁷⁷

ANTITRUST TIGHTROPE: COMPETITION LAW'S COMPLEX DANCE

In the unfolding relationship between Intellectual Property collaboration and competition law, the interaction of patent pools and antitrust regulation creates a paradox as on one hand, it enhances the innovation accessibility combined with reduced transaction costs, while on the other hand, it creates a mechanism for market control.⁷⁷⁸ This duality hits antitrust rules, as it views competitor collaboration with suspicion. When there is a portfolio of essential patents held by a single entity or a group of entities that conform to the industry standard, they can effectively use it to control the market. This market concentration is due to the dominant position held by the entities, which raises the question of anti-competitive behaviour.⁷⁷⁹ The most prominent recent development involves China's 'State Administration for Market Regulation' ("SAMR") issuing a warning letter to a patent pool viz. 'Avanci'. As is observed by experts, "This pool underlines potential antitrust risks in licensing of its SEPs for automotive wireless communication".⁷⁸⁰ Additionally, negotiation of the patent pools can be expensive, and it can also facilitate the formation of a cartel by major stakeholders which leave out new entrants in the market while it can also exclude holders having smaller number of patents. Hence, patent pools must undergo clearance by regulatory authorities due to there being a possibility that they could result in a monopoly.⁷⁸¹

Regulatory mechanisms help mitigate these antitrust risks. Herein, there are various strategies that can be adopted. Firstly, regular updates or reviews of patent pool terms and conditions to ensure adherence to the antitrust laws is recommended.⁷⁸² Secondly, the 'Essential Facilities Doctrine' ("EFD") is a highly debated legal principle within the ambit of antitrust law. It applies to intellectual property disputes when the IP holder maintains a dominant position in the market.⁷⁸³ EFD prohibits unreasonable usage of power by large firms to

⁷⁷⁷ Jorge L. Contreras, ED., *The Cambridge Handbook Of Technical Standardization Law* (Cambridge Univ. Press 2017)

⁷⁷⁸ WIPO Secretariat, *supra* note 4.

⁷⁷⁹ *Competition Law Regime And Patent Pooling*, <https://www.mondaq.com/india/patent/1490498/competition-law-regime-and-patent-pooling> (last visited Aug. 8, 2025).

⁷⁸⁰ *Chinese Antitrust Enforcement Agency Issues Warning to Patent Pool*, <https://www.jonesday.com/en/insights/2024/07/chinese-antitrust-enforcement-agency-issues-warning-letter-to-patent-pool> (last visited Aug. 8, 2025).

⁷⁸¹ Victor Rodriguez, *Patent Pools: Intellectual Property Rights and Competition*, 4 OPEN AIDS J 62 (2010), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2831195/>.

⁷⁸² Sarah Lee, *The Ultimate Guide to Patent Pools and Antitrust Law*, <https://www.numberanalytics.com/blog/ultimate-guide-patent-pools-antitrust-law> (last visited Aug. 8, 2025).

⁷⁸³ Sarah Lee, *Essential Facilities Doctrine in Antitrust Law*, <https://www.numberanalytics.com/blog/essential-facilities-doctrine-antitrust-intellectual-property> (last visited Aug. 8, 2025).



suppress competition by exploiting their IP rights. Still, these principles are in a jurisdictional arbitrage⁷⁸⁴ because of Article 102 of the TFEU⁷⁸⁵ and Section 2 of the US' Sherman Act, 1890⁷⁸⁶. As the EU imposed a special responsibility on firms not to impair competition, it led to a broader duty to deal as was observed in *Microsoft v. Commission*⁷⁸⁷, wherein the European Commission provided access to competitors about the Windows interoperability from Microsoft. While the US did not mention any general obligatory duty to deal under the 'Colgate Defense'⁷⁸⁸, quite surprisingly, in *United States v. Line Material Co.*, it was held that "A patent pool that restricted competition and fixed prices was unlawful".⁷⁸⁹ Thirdly, implementation of the FRAND Licensing terms is crucial. Lastly, the development of an independent governance framework to check the activities of patent pool holders is a need of the hour. This proactive stance transforms compliance from an obligation to enhancing the reputation of patent pool holders, which would, as a result, promote trust among holders and that will lead to a collaborative and efficient innovation ecosystem.

DEVELOPING ECONOMIES: BRIDGING THE INNOVATION DIVIDE

Developing economies have struggled with access to technologies, medicines and innovation, which has, in turn, hindered their socio-economic progress.⁷⁹⁰ In these economies, patent portfolios are limited because the strong intellectual property protections lead to higher royalty and license fee payments resulting in excessive dependence on technology borrowing from developed countries. This situation also leads to 'Brain Drain' as skilled professionals cannot fully engage in their native countries due to limited access to cutting-edge technologies and research facilities, ultimately leading to lower local development. It has been contended that there should be a geographical expansion of patent pools rather than bundling up patents in a specific region.⁷⁹¹ Firstly, patent pools hold a notable value for developing nations, which would substantially reduce the financial burden on local manufacturers therein. Secondly, patent pools would help emerging economies by enabling the quicker adoption to produce modern technologies more efficiently in their industries and services. Thirdly, offering bundled licenses at a lower rate will reduce the financial burden on the local manufacturer. This economic help promotes domestic manufacturing of goods and services that advances industrial growth and

⁷⁸⁴ Troberg, Maria Charlotte, *Differences between the U.S. and the EU in Antitrust Review of Intellectual Property: A Comparative Analysis of the Essential Facilities Doctrine*, *Great Antitrust Review*, 2011

⁷⁸⁵ Treaty on the Functioning of the European Union art. 102, Oct. 26, 2012, 2012 O.J. (C 326) 47

⁷⁸⁶ Sherman Antitrust Act, 15 U.S.C. § 2 (2018)

⁷⁸⁷ *Microsoft Corp. v. Comm'n*, Case T-201/04, 2007 E.C.R. II-03601.

⁷⁸⁸ *United States v. Colgate & Co.*, 250 U.S. 300 (1919).

⁷⁸⁹ *United States v. Line Material Co.*, 333 U.S. 287 (1948)

⁷⁹⁰ *Medicines Patent Pool: Facilitating Access to HIV Treatment*, <https://www.wipo.int/web/wipo-magazine/article-details/?assetRef=37742&title=medicines-patent-pool-facilitating-access-to-hiv-treatment> (last visited Aug. 8, 2025).

⁷⁹¹ *Patent Pools Can Promote the Diffusion of Life-Saving Drugs in Developing Countries*, VOXDEV, <https://voxdev.org/topic/health/patent-pools-can-promote-diffusion-life-saving-drugs-developing-countries> (last visited Aug. 8, 2025).



leads to creation of more local jobs while also reducing the reliance on costly imports from developed countries. Lastly, this type of exposure would foster R&D that would lead to organic development of a local innovation ecosystem and a sustainable culture of innovation.

In India, patent pools not only act as an innovation or technology provider but are also related to the humanitarian aspect. These pools have played an important role in providing affordable access to essential medicines in India during the most critical time of COVID-19, thereby saving millions of lives. The Medicines Patent Pool (“MPP”) issues non-exclusive licenses with low or zero royalty rates that cover a wide radius of geographical scope, thereby facilitating widespread access to essential medicines. To be precise, yearly treatment costs for HIV-AIDS is lower than US\$70 in parts of the African continent which is dramatically less than US\$10,000 in Europe, largely because of the MPP’s efforts in this specific field.⁷⁹² In recent times, the ‘Africa Renewable Energy Manufacturing Initiative’ aims to build local manufacturing ecosystems by leveraging patent pools to increase the uptake of climate related innovation leading to energy transition technologies.⁷⁹³

At the end, for developing countries to use the full potential of the patent pool there needs to be a policy roadmap that can be implemented by the government with the help of international cooperation. Firstly, there needs to be an identification process of crucial technological gaps and specific sectors where the patent pool would lead to the greatest impact, followed by the implementation in developing countries. Secondly, there needs to be collaboration among government agencies, local industry players, academic institutions, research organisations, and organisations like the World Bank and WIPO that can provide a neutral platform for technical and funding assistance. Thirdly, there needs to be clear and transparent guidelines for the patent pool formation and operation, like evolving segments of FRAND terms. Lastly, there is a need for a sustainable funding mechanism to support pool establishment with local capacity building for absorption, adaptation and indigenous innovation building. Simultaneously, establishing a monitoring to ensure fair access and regular checks on the patent pools’ objectives is crucial. Without these interconnected elements, even a well-intended pool may fail to achieve its development potential. This also indicates that patent pools are not a standalone solution, but a small segment of a broader framework adopted by the developing countries.

⁷⁹² *Transformative Partnership between the Medicines Patent Pool and ViiV Healthcare Enables 24 Million People in Low- and Middle-Income Countries to Access Innovative HIV Treatment - MPP*, <https://medicinespatentpool.org/news-publications-post/transformative-partnership-between-the-medicines-patent-pool-and-viiv-healthcare-enables-24-million-people-in-low-and-middle-income-countries-to-access-innovative-hiv-treatment> (last visited Aug. 8, 2025).

⁷⁹³ *New Africa Renewable Energy Manufacturing Initiative Will Help Unleash 1.2 Terawatts Of Renewable Energy, Create Up To 14 Million Jobs, And Increase GDP By Over Six Percent By 2050*, SUSTAINABLE ENERGY FOR ALL | SEFORALL, <https://www.seforall.org/press-releases/new-africa-renewable-energy-manufacturing-initiative-will-help-unleash-12-terawatts> (last visited Aug. 8, 2025).



FUTURE HORIZONS: PATENT POOLS IN INNOVATION LANDSCAPE OF THE FUTURE

The galloping advancement in technologies presents a challenge ahead of the patent pools' framework. The patent pool framework has mostly thrived in the tunnel of tangible innovations and now comes to the unique characteristics of innovation in modern times, creating a challenge. The complexities surrounding artificial intelligence ("AI") and machine learning raises the question of inventorship when there is a contribution that has been made by the AI. A concurrent problem is related to cryptocurrency, which is built upon the principle of decentralisation and open sources that shake the very notion of proprietary ownership. Furthermore, in climate technology, there is a tussle between profit and the public good because of the rapid global deployment and patent rights. Finally, the problem of biotechnology and genetic data raises concerns related to the legal hurdles, healthcare accessibility and individual privacy.

To address challenges, the policymaker should develop a roadmap that is not only technology agnostic but also focuses on the model of collaborative patent pools. Rigid and slow-moving laws will quickly become relics of a bygone era. Firstly, there should be adoption of real time licensing and dynamic pricing models that allow for greater flexibility, which enables innovators to adapt strategies to change the market demand. Secondly, blockchain based patent pool management, which might be too far sighted but can be used in offering a transparent and immutable ledger for tracking ownership and licensing agreements which would reduce disputes and efficient administration system. Thirdly, an automated royalty calculation and distribution system can be efficient and would optimise the process of compensating multiple patent holders, ensuring fairness and efficiency in the large pools. Innovators in this situation can use the future framework strategically by actively participating in patent pools.

CONCLUSION

Patent pools represent valuable tools for managing intellectual property in an interconnected world. It simplifies the procedure of licensing, reduces transaction costs and addresses the issue of 'patent thickets' that often hinders progress. The analysis of regulatory mechanisms has shown that patent pools operate within a legally defined environment due to which they are subject to antitrust laws at the national and international levels. A key contention of this multifaceted aspect deals with various methodologies that are present under various approaches to deal with royalty distribution. Though each method carries distinct advantages as well as limitations, they must be decided based on the pool's objective. Moreover, for developing countries, patent pools offer a transformative hope that reduces the barriers to enable domestic innovation in the ecosystem. However, at the same time, it must be understood that patent pools are not a universal solution. Success depends upon their careful and monitored implementation with robust governance. While these pools promote efficiency and innovation, they must avoid creating barriers for new entrants or enabling price-fixing



behaviours. Lastly, FRAND licensing terms, independent governance frameworks and regular compliance reviews help maintain this balance. When properly regulated and implemented, patent pools transform potential barriers into bridges of innovation, serving the broader socio-economic goals while maintaining competitive dynamics essential for continued progress.



CHAPTER 25

STANDARD ESSENTIAL PATENTS AND THE FUTURE OF INNOVATION: LEGAL AND POLICY PERSPECTIVES IN AI, GREEN TECHNOLOGIES, AND DIGITAL PLATFORMS

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ABSTRACT

A standard essential patent is a category of patent which is usually produced by standard development organization (SDOs) for patenting the new technological innovations which are essential to implement a 'standard'. A 'Standard' is a technical description which is usually decided or set-up by the organizations for making the work of technologies more efficient and beneficiary for the peoples. Though the term in itself looks complicated but it vital to setup some standards, which plays a crucial role in enabling creativity and incentivizing innovation. An inventor gets the patent for SEP, if the invention holds the criteria of the particular industry standard. If the invention comes under SEP the inventor or patent holder obligate to offer their SEPs on fair, reasonable and non-discriminatory (FRAND) licensing terms, which also make him eligible to get the royalties for the SEPs. This paper examines the dynamic transformation of SEPs in multiple domains, keeping our focus on importance of SEPs in the field of – Artificial Intelligence, Green Technologies, and Digital Platforms. How these SEPs can help India in achieving its developmental and climate goal. Also, this paper will focus on the ways forwards for the shifting of monopoly in SEPs of big giants to SMEs, small-cap and mid-cap businesses.

KEYWORDS: SEPs, Artificial Intelligence, Green Technology, Digital Platforms, FRAND

INTRODUCTION

Patent is a type of license based on monopoly over new inventions for a limited period. For instance, in India, it is governed by the Patent Act, 1970 and is granted for a period of 20 years while simultaneously bestowing sole ownership to the inventor along with the right against trespassing or infringing upon the patent.⁷⁹⁴ Among the various types of patents, Standard Essential Patents (SEPs) play a significant role in shaping technology and

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⁷⁹⁴ India, *The Patents Act*, No. 39 of 1970, India Code (2023).



industry standards. SEPs are categories of patents which are usually produced by Standard Development Organizations (SDOs) for patenting new technological innovations which are essential to implement a 'Standard'. A 'Standard' is a technical description which is usually decided or set up by organizations like ETSI, IEEE, or ITU, for making the said technology more beneficial for people. Standardization of essential patents not only impacts the global giants, but is also paramount for the development of the common man as evidenced by the standardization witnessed in areas like Information and Communication Technology, i.e. ICT (e.g.- Wi-Fi, 3G, text messages, digital camera systems, etc.), Internet of Things i.e. IoT (automated electric grid systems, traffic regulations, smart city initiatives, public health and infrastructure, etc.)⁷⁹⁵ SEPs are thus patents which safeguard important technologies in order to enable it to become a part of a globally agreed standard. SDOs claim ownership of the patent, and not the patentee, while assuring that the inventor gets fair compensation and royalties for his invention in accordance with the FRAND (Fair Reasonable and Non-Discriminatory) license terms, which overall ensures a fair competition in a global marketplace, thus maintaining interoperability for the development of the society. With the facets of technology seeping into fields like artificial intelligence (AI), green technology, and the increasing role of digital platforms in today's world, it has become imperative to study SEPs in the light of these three fields to align the developmental goals including UNSDGs, UNFCCC guidelines, and circular economy for a globalized market. With the majority of market share of SEPs being dominated by corporate giants and ambiguity in terms of fair, reasonable and non-discriminatory (FRAND) licensing, the SMEs, small and mid-cap businesses are left out from utilizing the potential of SEPs.⁷⁹⁶ More difficulties lie in the undisclosed licensing and royalty frameworks and expensive proceedings, lack of formal alternate dispute resolution systems, and unregulated standards, which create disparity or the lack of interaction between the private and public sector, crucial in this regard. This paper will also examine the new shift in the field of SEPs and its impact on conventional intellectual property policies, and will also suggest a resilient way forward for framing better policies in the future for public welfare.

EVOLUTION AND SCOPE OF SEPS AND MAJOR STAKEHOLDERS

Standard Essential Patents (SEPs) are the patents given for innovations which maintain a unique status in the field, making them compatible with the standards set-up by Standard Setting Organizations (SSOs).⁷⁹⁷ These

⁷⁹⁵ Michael Borrus, *Standards, Patents, and ICT: The Race for Leadership*, Tech. Pol'y Inst. (2023), <https://techpolicyinstitute.org/publications/standards-patents-and-ict-the-race-for-leadership>.

⁷⁹⁶ Jorge L. Contreras, "Patent Holdup, Royalty Stacking, and the Practical Limits of FRAND," 68 *Antitrust Bull.* 421 (2023).

⁷⁹⁷ World Intellectual Property Organization (WIPO), *Standard Essential Patents*, WIPO, <https://www.wipo.int/en/web/patents/topics/sep> (last visited Aug. 8, 2025). WIPO ETSI, *Guide on Intellectual Property Rights* (10 June 2021), <https://www.etsi.org/images/files/IPR/etsi-guide-on-ipr.pdf> (last visited Aug. 8, 2025).



SSOs maintain and ensure access to the innovation by other parties on FRAND terms.⁷⁹⁸ SEPs are not a novel feature as Standards have been used and maintained by our forefathers in the past for their convenience and easement in trade. For instance, standards like uniformity in bricks and stones in the ancient Harappan civilization and standardized railway gauges during the era of steam engines.⁷⁹⁹

In the modern world, these Standards have seeped in different domains according to the needs of consumers. In the basic sense, most SEPs have been developed in the field of technology and telecommunication. For instance, use of SEPs in Type-C port for charging, Wi-Fi, Bluetooth and now in 5G, plays a crucial role for rapid adaptability of these technologies and preparing the path of interoperability between companies and end users. India itself hosts about 1.99 billion telephone users as of March 2024, which is a testimony of the penetration of SEPs in the telecom sector.⁸⁰⁰ Standard Setting Organizations (SSOs) and Standard Development Organizations (SDOs) such as Telecom Standards Development Institute of India (TSDSI), International Telecommunication Union (ITU)⁸⁰¹ work in collaboration with other stakeholders such as businesses, universities and individuals to develop these SEPs and set the Standards ensuring the efficiency essential for global connectivity and functionality of modern technologies. These organizations also set the mandate that owners of the SEPs must license their patents on the terms that are fair, reasonable and non-discriminatory (FRAND). With the development of time, SEPs also evolved in multiple domains like AI, clean tech, IoT, basically encompassing most of modern-day technologies.

SEPS IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Artificial Intelligence (AI) and Machine Learning (ML) have become instrumental in making human life easier and are set to have a transformative impact in a variety of fields encompassing healthcare, security, transportation, energy, finance, etc. AI tools get input from the user in the form of a prompt and based on the training modules (*Large Language Modules* i.e. LLMs) used to train them, process massive volumes of data to generate outputs simulating human intelligence. With an increased penetration of AI and Machine Learning in fields like bioinformatics, biomechanics, public health, law and order, Internet of Things (IoT), energy management, social and behavioural sciences, transportation, autonomous vehicles, aerospace, engineering

⁷⁹⁸ Int'l Telecomm. Union (ITU), *IPR / Standardization* (site), <https://www.itu.int/en/ITU-T/ipr/Pages/default.aspx> (last visited Aug. 8, 2025).

⁷⁹⁹ J. M. Kenoyer, *Measuring the Harappan World: Insights into the Indus Order and Cosmology*, in *The Archaeology of Measurement* 106–22 (I. Morley & C. Renfrew eds., Cambridge Univ. Press 2010), <https://www.harappa.com/sites/default/files/pdf/Kenoyer%202010%20Measuring%20the%20Harappan%20World.pdf> (last visited Aug. 8, 2025).

⁸⁰⁰ USB Impl. Forum, *USB Type-C® Cable and Connector Specification, Release 2.4* (Oct. 28, 2024), <https://www.usb.org/document-library/usb-type-cr-cable-and-connector-specification-release-24> (last visited Aug. 8, 2025).

⁸⁰¹ World Intellectual Property Organization (WIPO), *Standard Essential Patents*, <https://www.wipo.int/patents/en/topics/sep.html> (last visited Aug. 8, 2025).



traffic, etc., it is imperative to establish standards in this field to establish fair trading marketplaces in a global marketplace.

Since AI emerged in 1950,⁸⁰² nearly 3,40,000 AI-related inventions have been documented, a majority of which have been published after 2013.⁸⁰³ According to a study by WIPO Technology Trends, 2019 it was found that Machine Learning patent applications have an average annual *growth rate of 28%* and comprise close to one-third of AI-related patents. Baidu has the largest portfolio of patents related to deep learning, followed by Alphabet, Siemens, Xiaomi, Microsoft, Samsung, IBM, and NEC.⁸⁰⁴ These studies indicate that AI has transcended domains and this widespread interdisciplinary application of AI calls for the setup of some Standards to regulate this field. This paper finds the four major and most important fields to set up Standards in the industry of Machine Learning technologies - wireless communication networks, transmission of digital information (e.g., telegraphic communication), electric digital data processing, and conjoint control of vehicle sub-units. These fields are crucial in today's world as they serve the purpose of mapping functions, path finding of automatic cars, data processing, and similar ancillary works. This rapid development in the field of AI is more likely to grow exponentially in future in lieu of more innovations fostering the need for exploration of AI and Machine Learning in development of various fields of study.

NEED FOR STANDARDIZATION IN GLOBAL AI FRAMEWORKS

Setting up standards has become crucial in this era of the advent of Artificial Intelligence. The framework of these standards would help tackle the anti-trust concerns in commercial licensing. It will also regulate the parameters for regulating the FRAND licensing and will also guarantee the patentee a wide scope for negotiations, retaining exclusive ownership rights and maintaining their royalties⁸⁰⁵. Countries like China, India and the United States have their own framework for regulating the standards of Artificial Intelligence, with USA dominating the field with its iron-clad frameworks and policies.⁸⁰⁶ If a worldwide framework is not established, it will lead to the dominating players would by default export their products to the developing and the *least developing countries* (LDC) forcing them to comply with these standards. There is a pressing need where

⁸⁰² Alan M. Turing, *Computing Machinery and Intelligence*, 59 *Mind* 433 (1950).

⁸⁰³ World Intellectual Property Organization (WIPO), *WIPO Technology Trends 2019: Artificial Intelligence* 40 (2019), https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1055.pdf (last visited Aug. 8, 2025).

⁸⁰⁴ World Intellectual Property Organization (WIPO), *WIPO Technology Trends 2019: Artificial Intelligence* 15 (2019), https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1055.pdf (last visited Aug. 8, 2025).

⁸⁰⁵ U.S. Dep't of Justice, U.S. Patent & Trademark Off., & Nat'l Inst. of Standards & Tech., *Draft Policy Statement on Licensing Negotiations and Remedies for Standards-Essential Patents Subject to Voluntary F/RAND Commitments* (Dec. 6, 2021), <https://www.justice.gov/opa/press-release/file/1453826/download> (last visited Aug. 8, 2025).

⁸⁰⁶ NITI Aayog, *National Strategy for Artificial Intelligence* (Mar. 2023), <https://www.niti.gov.in/sites/default/files/2023-03/National-Strategy-for-Artificial-Intelligence.pdf> (last visited Aug. 8, 2025).



citizens, private industries, national governments and international institutions must work collectively to establish a global standard for regulating AI on an institutional level, which can maintain homogeneity across diverse disciplines and coalitions.

One such step taken to open the gates for new inventions by AI in SEPs is the creation of *MPAI (Moving Picture, Audio, and Data Coding by Artificial Intelligence)*.⁸⁰⁷ MPAI is a non-profit international organization set-up for adopting new standards in AI modules and workflows with specifications like *MPAI-AIF* and *MPAI-MMC* in order to create a balance in policies in the field of Intellectual Property Rights. In the long run, this can help in reducing the friction in patent licensing caused by non-regulation of the *FRAND* guidelines. Initiatives like MPAI can be the possible solution to bridge the gap between new technological specifications and their development through IPR guidelines.

GREEN TECHNOLOGIES AND THE ROLE OF SEPS IN ENVIRONMENTAL SUSTAINABILITY

According to a report by *World Meteorological Organization* (WMO), 2024 was recorded as the warmest year in the past 175 years. Climatic conditions have not worked in favour for everyone with Indians suffering from extreme climatic fluctuations. In 2024, some cities have already recorded mercury levels above 55° C. Africa is also bearing the brunt of climate change by undergoing a critical water crisis. Moreover, the increasing geopolitical tensions like the Ukraine-Russia war has resulted in an oil crisis in Europe, which serves as a wakeup call for acting against the acute issues rising due to the climate crisis. The world is trying to cope up with these crises by adopting preventive as well as curative measures like the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol along with adopting internal policies to give effect to the Paris Agreement. In a climate-resilient future, technology plays a vital role. This might seem juxtapositional as development has caused the greatest damage to environment, but if harnessed properly, technology can act as a saving grace for humanity.

While tackling the problems caused due to climate change, the major focal point should be agriculture and energy renewal technologies as these are the biggest contributors for the degradation of the environment, with agriculture alone producing 13-21% of the global greenhouse gas emissions and energy production contributing to a sizeable 70% share. The need for reforms becomes more vital given the exponential rise in population and the rapid and uncontrolled urbanization. Some steps are already being taken by governmental as well as non-governmental organizations like the ECO patent introduced in the World Business Council for Sustainable Development in 2008 which facilitates climate sustainability through sharing patents on green technologies.

⁸⁰⁷ MPAI (Moving Picture, Audio and Data Coding by Artificial Intelligence), *MPAI-AIF — Artificial Intelligence Framework (Technical Specification)* (v.2.0), <https://mpai.community/standards/mpai-aif/> (last visited Aug. 8, 2025)



Participating companies like IBM, Bosch, Sony and DU Point have shared an array of technologies for conserving water, energy, and agriculture. This initiative provided for a royalty-free access to 248 patents before it was discontinued in 2016. In 2010, the Green X-change was launched in 2010 at Davos, Switzerland, which was a not-for-profit initiative undertaken by Nike, Best Buy, Yahoo, Creative Commons, Mountain Equipment Company, IDEO, Outdoor Industry Association, Salesforce.com and 2Degrees. This model, which was operational till 2015, introduced 3 distinct licensing structures- a standard option, an extended plus variant, and a research non-exempt option.

It has been observed that though there are efforts being taken to tackle environmental problems, there hasn't been a unified effort which encompasses and governs all subsequent policy decisions by setting up a standard in the world. Standardization becomes imperative in fields like intelligent transport systems in self-driving cars, remote healthcare solutions, irrigation technologies to name a few. In the automobile sector alone, standardization is expected to generate 30% of the total revenue by 2030, which can be further used to develop more SEPs, sustainability solutions, and creation and further development of cutting-edge technologies in the allied sectors.⁸⁰⁸ In order to move towards a carbon-neutral world till 2050, there needs to be a huge investment in research and development, the creation of a global system of green-tech solutions and its adherence by member nations, and a strong collaborative effort between all the stakeholders right from the academic level to the institutional and policy-making rung.

CHALLENGES IN DIGITAL PLATFORMS AND PUBLIC INFRASTRUCTURE

Digital platforms have experienced a massive user spike owing to the increasing population and digital literacy, particularly in the fields of education, public health, traffic management, and banking. The growing digital infrastructure calls for strict maintenance of digital frameworks, which if regulated well, can be of the greatest benefit for the people. Operations like trading in securities market, payment getaways in banking, fintech applications have transformed from a physical to an electronic format in the past few years. It is the need of the hour to regulate these operations as these standards can benefit innovators grow and compete with the giants of the industry. SEPs will also benefit from the 'One for All' FRAND regulations, a framework which will ensure equal access to all and transferability and interoperability between all stakeholders. Presently, the dominance in distribution of digital markets is evident with giants like Qualcomm, Ericson, Huawei, Nokia among others monopolizing the declared SEPs. A global policy which will regulate all transactions will help MSMEs, cottage industries, and small-scale enterprises by creating a level playing field for them. A regulation with FRAND terms will ensure homogeneity in royalty rates, territorial pricing and non-discriminatory access

⁸⁰⁸ IEEE Standards Board Bylaws & IPR policy (see IEEE Standards Association, *Standards Board Bylaws* (clauses on Essential Patent Claims and IPR)), <https://standards.ieee.org/about/policies/bylaws/sect6-7/> (last visited Aug. 8, 2025).



to the developing players, thus reducing litigation, also minimising expensive cross-border disputes, which are disadvantageous to the small innovators. A worldwide uniform regulatory policy can also promote emerging technologies by seamless diffusion of revenues in developing economies and fostering innovation and development.

CONCLUSION

The trajectory of Standard Essential Patents (SEPs) spans across a multitude of domains and fields, with a notable evolution from a niche in telecommunications to an array of technological ecosystems encompassing Artificial Intelligence (AI), green technology, and the rapidly evolving digital platforms. This points towards the interoperability on a technological level while highlighting the need of the hour to urgently work on frameworks which are adaptable, robust, and equitable to all stakeholders at all levels, right from small scale innovators to multinational giants. This is to accommodate the increasing innovations and rapidly developing digital infrastructure in the light of the Industrial Revolution 4.0 without stifling access to the smaller enterprises and companies. Standard Essential Patents (SEPs) have challenges which extend beyond the academic realm.⁸⁰⁹ As artificial intelligence becomes a core part of the public infrastructure whether it is cashless payment systems or self-driving cars and Internet of Things (IoT), the standardization of these technologies is imperative not just in the interest of the people, but also for fostering innovation and faster development of newer and better technologies in the technological sector. The scales of power are presently imbalanced with a handful of giants like Baidu, Alphabet, and Microsoft dominating the patent ecosystems in the field of Artificial Intelligence. In such a scenario, it is imperative to view Standard Essential Patents as not just tools in intellectual property regulation, but also as instruments which govern policies at an industrial level along with drivers for digital sovereignty. If global frameworks which work on *FRAND* terms and equitable access are not adopted at the earliest, there will be an imbalance in the global power dynamics with a handful of developed countries controlling the means, regulatory norms, and frameworks of intellectual property in SEPs, which they would then force the developing countries to follow, thus sidelining small-scale and local innovators in such countries. It is evident that artificial intelligence as an emerging field is brimming not just with opportunity, but also complexity and newer and technically difficult challenges which have rarely been heard of before. The filing of patents in fields like deep neural networks, machine learning, large language modules, etc. have seen an exponential rise in the past decade with WIPO findings exhibiting an average of 28% increase in AI-related patent applications per year since 2013.⁸¹⁰ While this is indicative of the dynamic rise of the domain, it also

⁸⁰⁹ Tim Pohlmann, *The Rise of Standard-Essential Patents* (IPlytics Oct. 2021), <https://www.lexisnexisip.com/wp-content/uploads/2023/09/IPlytics-2021-The-Rise-of-Standard-Essential-Patents.pdf> (last visited Aug. 8, 2025).

⁸¹⁰ World Intellectual Property Organization (WIPO), *WIPO Technology Trends: Artificial Intelligence (2019)* (Executive Summary), https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1055_exec_summary.pdf (last visited Aug. 8, 2025)



opens up a floodgate of new complexities for the newer players, mainly due to the lack of clarity in policies, declarations, and ambiguity in the Fair, Reasonable, and Non-Discriminatory (*FRAND*) regulations and commitments. This ambiguous nature of *FRAND* licensing obligations and policies, particularly in the field of artificial intelligence allows the larger firms to have their right of way in extracting favourable policy terms and delay interoperability which work against the spirit of the Paris Agreement and also goes against the core tenets of standardization.⁸¹¹ A welcome step towards interoperability, equitable access, and bringing about uniformity in policies and norms can be witnessed by the establishment of the Moving Picture, Audio, and Data Coding by Artificial Intelligence or MPAI, but it is pivotal for the institutionalizing of these efforts on a global front in order to create efficient regimes for setting standards and avoiding conflicts.

Standard Essential Patents also govern patents in environmental technologies, particularly those which support the mitigation of climate change and work towards resource efficiency. It is the need of the hour to join forces and work towards collaborative innovation towards reducing the emissions of greenhouse gases, majority of which are caused by agricultural practices and large-scale energy consumption. The models prevalent in the previous decades like the ECO-Patent Commons and the Green Xchange have been testimonial as to how it is possible for companies to share patented technologies voluntarily for the benefit of the masses, even though they have eventually lost the traction and support needed to bring about change on a global level for a sustained amount of time. If revived structurally, these models, backed by legal sanctions and immunities, would be instrumental for furtherance of the United Nations' Sustainable Development Goals i.e. UNSDGs and the Paris Agreement, which clearly specify environmental targets but lack the operational tools necessary for driving this change throughout the world, particularly in the field of green-tech IP and access of the same to everyone. If structured and developed properly, Standard Essential Patents would prove to standardize carbon-reducing technologies and also help in the widespread adoption across the globe, including the developed and the developing nation states. However, if undertaken without a unified strategy and an overlooking independent body, it can run into the risk of selective enforcement or preferential licensing, thus causing more harm than good and undermining equitable access and technology transfer. Out of the areas of study assessed herein, the field of digital platforms represents the most diverse and complex set of challenges when it comes to governance of Standard Essential Patents. Digital ecosystems have been the fulcrum of development of a nation with deep penetration into a multitude of fields, including smart city infrastructure, payment gateway systems, banking operations, public health systems, and cloud-based services. Despite this prevalence and dependence of almost all the essential day-to-day operations on digital platforms, there is only a small section of companies

⁸¹¹ Case C-170/13, Huawei Techs. Co. v. ZTE Corp., EU:C:2015:477 (C.J. July 16, 2015).



controlling the core technologies with Nokia, Huawei, Qualcomm, and Ericsson as the leading giants.⁸¹² With the terms of access being dictated by these players, and the opaque licensing and monopolistic pricing models that follow it has become impossible for start-ups to implement the sandbox for innovation and development, which creates impenetrable walls of barriers in the market, further leading to difficulties in cross-border enforcement and tedious litigation and jurisdictional challenges, making it cumbersome for the small rights holders and innovators. A solution to these problems is establishment of international arbitration forums and special tribunals and courts to delegate on these disputes which could lead to quicker resolutions, clearer jurisdictional enforceability, and a harmonized legal approach which can be followed and referenced to in case of disputes arising in the future. The development of soft law instruments under the aegis of the World Trade Organization (WTO) or the World Intellectual Property Organization (WIPO) can also offer solutions to member states, particularly the Global South, which has a wide pool of talent, by offering policies and frameworks to level the playing field. Furthermore, public awareness and pooling together resources is also imperative to ensure an equitable and participatory environment for SEP regulation. Engaging with IP offices, law schools, and industry giants can help develop training modules and programmes in an effort to demystify SEPs and equip the newer generations with more knowledge and resources. Standard Essential Patents have found themselves at the centre of social governance, economic development, and international technology transfer, thus influencing a multitude of fields ranging from artificial intelligence, public infrastructure, sustainability, and green-tech solutions. They govern and dictate, sometimes directly and sometimes through a chain of other factors, who gets benefitted and who gets left behind from the innovations, which makes their regulation not just important, but also urgent. The most optimal way forward is a multipronged strategic effort encompassing law, public policy, and international cooperation, to harness SEPs to the complete advantage of the human race and for its equitable progress and development.



⁸¹² IPlytics & LexisNexis, *Who Is Leading the 5G Patent Race?* (Oct. 5, 2023), <https://files.lbr.cloud/public/2023-10/Who%20is%20leading%20the%205G%20patent%20race%2C%202023%20report%20by%20LexisNexis%C2%AE%20IPlytics.docx.pdf> (last visited Aug. 8, 2025)



CHAPTER 26

STANDARD ESSENTIAL PATENTS AND THE AI DILEMMA: REIMAGINING FRAND COMMITMENTS FOR GENERATIVE ALGORITHMS AND MACHINE LEARNING MODELS IN THE GLOBAL SOUTH

- Sakkecham Singh Parmar *

ABSTRACT

Indeed, the rising profiles of Artificial Intelligence, particularly through generative algorithms and machine learning models, have brought forth new legal and policy implications that pose challenges to the old model of Standard Essential Patents (SEPs) and Fair, Reasonable, and Non-Discriminatory (FRAND) licensing. This policy paper significantly critiques the applicability and limitations of current mechanisms of governance for SEPs in the regulation of AI-based innovations, particularly in the context of the Global South. Central to this consideration is the research question: Are conventional models of SEP-FRAND adaptable to cope with the opaque, data-driven, and iterative nature of AI systems without impairing an equitable innovation space in developing economies? Methodologically, the paper will conduct a doctrinal and comparative legal analysis of SEP regimes as envisaged in the U.S., the European Union, and selected South Asian jurisdictions. The paper would apply these frameworks to real-life contexts of AI deployments, natural language processing tools, healthcare algorithms, and digital platforms, but from specific Indian and regional viewpoints. This paper addresses the questions regarding legal definitions while discussing the “essentiality” of AI components (i.e., trained models, datasets, and algorithmic layers). Exploring the implications of antitrust law regarding the licensing of SEPs within AI ecosystems also highlights how the adaptation of FRAND can address issues concerning royalty stacking, hold-up, and licensing discrimination in AI innovation markets. Finally, the document strings together a set of normative recommendations to WIPO, WTO, and national patent offices on developing AI-specific SEP guidelines, norms on transparent disclosure, and differentials in FRAND policies tailored to the Global South. This policy paper aims to add to the burgeoning scholarship on SEP-AI convergence and set the stage for inclusion-oriented, competition-friendly SEP governance, enabling sustainable technological development.

KEYWORDS: Standard Essential Patents, Artificial Intelligence Regulation, FRAND Licensing, Antitrust and Competition Law, Global South Innovation Policy

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INTRODUCTION

Intricacies concerning artificial intelligence (AI) and standard-essential patents (SEPs) present new challenges, especially for the Global South. The SEPs protect technologies that, for instance, serve the 5G and Wi-Fi standards, allowing for the licensing of inventions under FRAND (Fair, Reasonable, Non-Discriminatory) terms to prevent abuses by the right holders. Hence, FRAND means that royalties on SEPs will bear an important relation and be completely sympathetic to the actual worth of the patent, rather than being based on the market value of the patent holder.⁸¹³ In a more classical sense, that means (i) Fairness: royalty shall reflect the patent's contribution, (ii) Reasonableness: profit realisation by implementation is attributable to the patent itself, (iii) Non-discrimination: licenses to similar entities shall compare rates in equal measures. But the SEPs are said to induce a classical hold-up risk: that is, after a technology is sanctioned as a standard, the holder can claim royalties that are not reasonable. Conversely, in hold-outs, implementing parties may, be it rightly or wrongly, refuse to pay any royalties even if they were due. To balance the competing pressures, the FRAND structure insisted on good-faith licensing for the courts to consider all terms as a composite whole - one that would encompass pricing proposals, negotiation history, and actual contracts.⁸¹⁴

The SEPs-FRAND landscape is fundamentally inverted, in very many ways, by AI. The quintessential road from patents to protected inventions in AI synopsis mega data and gargantuan training of models, unlike in traditional inventions, which tend to be discrete inventions of hardware. Add to this the consideration that the actual value of an AI system is founded on several, in fact possibly incongruent, protectable rights: the thousands of lines of software licensed, proprietary training data, and continual updates. Such dilution of value gives rise to severe uncertainty concerning essentiality: Certainly, since any AI solution is a global mix of algorithms and data, it is tough to determine what would be "essential" to a standard in contrast with a patent for a single chip. In the classical sense, therefore, a FRAND understanding of royalties that become due once in respect of a static technology, whereas, for AI, where models and data are ever changing, these royalties cannot simply be fixed.⁸¹⁵

⁸¹³ Benjamin C. Elacqua et al., Introduction to SEP & FRAND Issues, Intellectual Property Law Firm | IP Attorneys | Fish & Richardson (Dec. 11, 2024), <https://www.fr.com/insights/thought-leadership/blogs/introduction-to-sep-frand-issues/> (last visited Aug. 7, 2025).

⁸¹⁴ Benjamin C. Elacqua et al., Introduction to SEP & FRAND Issues, Intellectual Property Law Firm | IP Attorneys | Fish & Richardson (Dec. 11, 2024), <https://www.fr.com/insights/thought-leadership/blogs/introduction-to-sep-frand-issues/> (last visited Aug. 7, 2025).

⁸¹⁵ Benjamin C. Elacqua et al., Introduction to SEP & FRAND Issues, Intellectual Property Law Firm | IP Attorneys | Fish & Richardson (Dec. 11, 2024), <https://www.fr.com/insights/thought-leadership/blogs/introduction-to-sep-frand-issues/> (last visited Aug. 7, 2025).



These monopolistic public data sets could thrive outside the patent regime, where few major players monopolise access to such infrastructure, training data, and other AI-relevant information.⁸¹⁶ Algorithmic collusion through self-learning pricing algorithms to tacitly coordinate prices among rival firms is yet another risk legitimised by AI.⁸¹⁷ All these issues, ambiguous data value, obscure algorithms, and quick evolution-are starving FRAND postulates and attacking competition at the weakest regulatory juncture.

The paper illuminates South Asian challenges with references from the U.S., EU, and other Asian jurisdictions. How courts and regulators have tackled SEP-FRAND cases landmark cases included and regarding AI-associated antitrust risks, with a foregrounding of policy framework recommendations to guarantee fair AI licensing, will be examined. In this way, with the cases (for example, Qualcomm in the U.S., *Huawei v. ZTE* in Europe, and Nokia-OPPO disputes in India), we will provide an international analysis that gives a well-rounded comparative perspective.⁸¹⁸ The proposed reforms, from the restructuring of global IP governance to shaping national-level patent guidelines, may convert FRAND into a much more useful concept in this data-driven era of AI while ensuring protection of innovation in the Global South.

SEPS AND FRAND: FOUNDATIONS OF LICENSING

A Standard Essential Patent (SEP) refers to a patent whose use is required by the standard established by the appropriate standard authority, such as 3G/4G/5G, Wi-Fi, Bluetooth, etc.⁸¹⁹ To this end, SSOs expect their participants to disclose patents that directly cover the specification of the standard and license them. In practice, some SEP owners give an irrevocable pledge of FRAND, that is, they make an advance payment for granting licenses on Fair, Reasonable, and Non-Discriminatory terms. For

⁸¹⁶ Courtney Radsch, *Dismantling AI Data Monopolies Before it's Too Late* | *TechPolicy.Press*, Tech Policy Press (Oct. 9, 2024), <https://www.techpolicy.press/dismantling-ai-data-monopolies-before-its-too-late/> (last visited Aug. 7, 2025).

⁸¹⁷ Grace Zhao & Dr Sven-Michael Werner, *Brief Analysis on Artificial Intelligence and Antitrust in China*, Passle (June 17, 2025), <https://competitionlawinsights.twobirds.com/post/102kfld/brief-analysis-on-artificial-intelligence-and-antitrust-in-china#:~:text=The%20current%20challenge%20facing%20antitrust%20enforcement,nor%20is%20it%20biased%20to> (last visited Aug. 7, 2025).

⁸¹⁸ *Huawei v ZTE case*. Case No. C-170/13.

⁸¹⁹ András Jókúti, *Fundamental FRAND dependability: why standardizing technology is not just peanuts*, WIPO - World Intellectual Property Organization (Dec. 9, 2024), <https://www.wipo.int/web/wipo-magazine/articles/a-frand-in-need-why-establishing-standardized-technologies-is-so-complicated-69933#:~:text=SEPs%20protect%20inventions%20that%20are,where%20the%20second%20phase%20begins> (last visited Aug. 7, 2025).



example, ETSI, the European Telecommunications Standards Institute, requires that a written commitment be given by an SEP holder stating its willingness to license on FRAND terms.⁸²⁰ There are other ways in FRAND to prevent patent hold-up; after the technology was adopted by the standard, an SEP holder could use its monopoly to ask for exorbitant royalties. Courts then considered some guiding principles: generally, an SEP licensee pays an ex ante royalty (one that reflects the patent's value before standard adoption) to the SEP owner.⁸²¹ Secondly, FRAND royalties are determined as a composite whole that balances fairness, reasonableness, and non-discrimination; for example, judges commonly compare the rates proposed by the licensee to rates paid by "similarly situated" licensees, considering geographical variations, volume of sales, or type of products. Thirdly, the courts assessed the good faith of negotiations: would the parties engage continuously with each other, exchanging proposals and refusing to delay unreasonably. Either an implementer who suggests an unfair rate or an SEP holder who withdraws an earlier offer can be found to have acted in bad faith.⁸²² By securing FRAND commitments, SSOs achieve a fine equilibrium: innovators are compensated for their investment in research; implementers can be sure that they can obtain relevant licenses in an efficient way.⁸²³ The World Intellectual Property Organisation goes on to explain that "in the absence of FRAND commitments, an SEP holder may demand royalties as high as the value of the standard itself," placing very heavy costs on the neighbouring downstream markets. Indeed, as observed by the Competition Commission of India in *Micromax v. Ericsson* (2018), "hold-up" by SEPs "subvert(s) the competitive process," thus developing a cost advantage for the patent under

⁸²⁰ Benjamin C. Elacqua et al., *Introduction to SEP & FRAND Issues*, Intellectual Property Law Firm | IP Attorneys | Fish & Richardson (Dec. 11, 2024), <https://www.fr.com/insights/thought-leadership/blogs/introduction-to-sep-frand-issues/> (last visited Aug. 7, 2025).

⁸²¹ Ralph E. Labaton & David Shotlander, *No FRANDS in Antitrust? Qualcomm's Rejection of FRAND Violations as a Predicate to an Antitrust Violation* - Haug Partners, Leading Law Firm | Haug Partners, <https://haugpartners.com/article/no-frands-in-antitrust-qualcomms-rejection-of-frand-violations-as-a-predicate-to-an-antitrust-violation-2/#:~:text=SSOs%20generally%20require%20participating%20patent,to%20make%20patents%20available%20to> (last visited Aug. 7, 2025).

⁸²² Benjamin C. Elacqua et al., *Introduction to SEP & FRAND Issues*, Intellectual Property Law Firm | IP Attorneys | Fish & Richardson (Dec. 11, 2024), <https://www.fr.com/insights/thought-leadership/blogs/introduction-to-sep-frand-issues/> (last visited Aug. 7, 2025).

⁸²³ *India: SEPs and FRAND – litigation, policy and latest developments*, Global Competition Review (Oct. 22, 2024), <https://globalcompetitionreview.com/hub/sepfrand-hub/2024/article/india-seps-and-frand-litigation-policy-and-latest-developments#:~:text=In%20fact,%20in%20the%20case,6> (last visited Aug. 7, 2025).



consideration shifted to the ultimate consumer.⁸²⁴ Therefore, in essence, the concept of FRAND is an endeavour to preserve competition in the licensing process of SEPs.⁸²⁵

AI and Data Patents: AI innovation centres on algorithms and data. For example, a neural model's performance is closely tied to its architecture and training dataset, neither of which traditional patents normally protect. On the other hand, a dataset may never be fully disclosed or protected under patent laws but may fall under copyright or trade secret protection. This divergence creates a regulatory gap: patents are worthy of FRAND consideration, but data lies in murky, unregulated waters. Indeed, as one commentator states, “data is a defining characteristic of generative AI” and “critical to consideration of market power.” This means that big tech companies that own huge proprietary datasets effectively get a market advantage (a data monopoly in short) in the region, excluded from the FRAND regime. In practice, an AI company could claim that its supposedly “standard-essential” AI functionality needs datasets and architectures that are impossible for its competitors to license or audit. As for patents, data needed for FRAND would not be put under scrutiny because it sidesteps the definition of an input.⁸²⁶

Dynamic and Complex Innovation

AI systems evolve; an update to a self-driving car's software may be sent weekly, while machine-learning models are always improved based on data. Such dynamism challenges the FRAND concept of fixed royalties. Licensing assumes payment one or more times for a fixed set of patents, but with AI, the demands may vary as technology progresses. If changes are made to an AI-based standard (such as with respect to a voice codec or compression algorithm), does the license on the ENP still apply to the new system that was enhanced? In most countries, courts have not laid down a clear set of rules concerning the FRAND for ever-evolving SEPs. Moreover, innovation in the AI field tends to be cumulative and iterative. For such reasons, determining one “point” at which a violation occurred

⁸²⁴ András Jókúti, *Fundamental FRAND dependability: why standardizing technology is not just peanuts*, WIPO - World Intellectual Property Organization (Dec. 9, 2024), <https://www.wipo.int/web/wipo-magazine/articles/a-frand-in-need-why-establishing-standardized-technologies-is-so-complicated-69933#:~:text=SEPs%20protect%20inventions%20that%20are,where%20the%20second%20phase%20begins> (last visited Aug. 7, 2025).

⁸²⁵ *WIPO Lex, India, Telefonaktiebolaget LM Ericsson v Competition Commission of India and Another*, WIPO - World Intellectual Property Organization, <https://www.wipo.int/wipolex/en/judgments/details/2170> (last visited Aug. 7, 2025).

⁸²⁶ Courtney Radsch, *Dismantling AI Data Monopolies Before it's Too Late* | *TechPolicy.Press*, Tech Policy Press (Oct. 9, 2024), <https://www.techpolicy.press/dismantling-ai-data-monopolies-before-its-too-late/> (last visited Aug. 7, 2025).



for the sake of imposing royalty payments becomes virtually impossible. Some analysts question whether FRAND rates (say 10 per cent on 4G chips) are anything but irrelevant when required to be slapped on pioneering AI algorithms that invoke a different set of patents with actually newer datasets.⁸²⁷

Essentiality Ambiguity

Its value often lies in the implementation specifics, rather than in the single patented component; thus, it creates blurriness as to what could count as an essential AI component. An instance would be an AI model that implements a patented algorithm, but one whose overall functionality also involves the data pre-processing, without a patent on it, or patent-free open-source code. In contrast, the standard for 5G may feature AI implementations such as rapid evolution of machine-learning-based beamforming, whose patents are in contention. It is therefore particularly challenging to know which AI-related patents are really "essential" to the standard-not to say those merely utilised in the context of product design. An observation made by a European patent guide is that AI algorithms are abstract and patentable only when provided with a concrete technical effect.⁸²⁸ Many so-called AI "patents" can end up claiming mathematical methods; whether or not such a claim constitutes SEPs is often unclear.⁸²⁹ The absence of objective tests for essentiality-hermetically sealed and self-declared by patent owners-adds to the uncertainty. Likewise, proposals to introduce mandatory ex-ante essentiality checks heated up in the EU and, eventually, withdrew.⁸³⁰

Royalty Stacking

⁸²⁷ Benjamin C. Elacqua et al., *Introduction to SEP & FRAND Issues*, Intellectual Property Law Firm | IP Attorneys | Fish & Richardson (Dec. 11, 2024), <https://www.fr.com/insights/thought-leadership/blogs/introduction-to-sep-frand-issues/> (last visited Aug. 7, 2025).

⁸²⁸ *Navigating the New Frontier: AI Patentability at the European Patent Office*, Global lawyers for your business | Global | Eversheds Sutherland (Apr. 25, 2025), <https://www.eversheds-sutherland.com/en/united-kingdom/insights/navigating-the-new-frontier-ai-patentability-at-the-european-patent-office#:~:text=AI%20and%20machine%20learning%20,technical%20character%20for%20patent%20eligibility> (last visited Aug. 7, 2025).

⁸²⁹ Ryan C. Richardson & Christopher R. O'Brian, *IP Hot Topic: European Commission Suddenly Withdraws Proposed SEP Regulation*, Sterne Kessler (Feb. 12, 2025), <https://www.sternekeessler.com/news-insights/client-alerts/european-commission-suddenly-withdraws-proposed-sep-regulation/> (last visited Aug. 7, 2025).

⁸³⁰ András Jókúti, *Fundamental FRAND dependability: why standardizing technology is not just peanuts*, WIPO - World Intellectual Property Organization (Dec. 9, 2024), <https://www.wipo.int/web/wipo-magazine/articles/a-frand-in-need-why-establishing-standardized-technologies-is-so-complicated-69933#:~:text=SEPs%20protect%20inventions%20that%20are,where%20the%20second%20phase%20begins> (last visited Aug. 7, 2025).



New-generation AI products pack a mix of patented technologies, including chips, sensors, communication standards, etc., and software. This breeds royalty stacking, namely, if each SEP owner charges a percentage, the total burden may be significant. During SEP litigation, implementing companies repeatedly complain that the sum of royalties is too high since each SEP holder demands separate royalties. Analyses indicate that the absence of coordination, each SEP licensor ignores the externality on others, yielding SEP rates that collectively impair profits for the industry.⁸³¹ The risk is further aggravated for AI; for instance, a smart speaker could infringe SEPs of several 5G, Wi-Fi, and codec patents. A high cumulative rate alone might lock out smaller players. FRAND was meant to prevent high royalties from prevailing, but in practice, current case law usually treats each SEP portfolio in isolation. To cope with royalty stacking in AI products, something more comprehensive is required, such as global licenses covering all SEPs at once. A few courts have started to enter global FRANDs to cap demands, but they are inconsistent across countries in doing so.⁸³²

Hold-up vs. Hold-out Type in AI: In FRAND, hold-up comprises demanding royalties beyond those that would be considered FRAND after the adoption of the standard, with implicit threats of injunctions. Hold-out captures the situation in which the implementer intentionally delays or refuses licensing to the detriment of an uncertain circumstance. These apply in AI. Consider a powerful AI company in command of key SEPs instead of holding up its competitors by asserting unclear metrics of valuation (for instance, charging for the use of an AI "model" as if it were paying for a patented chip). The implementer, on the other hand, under the AI scenario may want to free ride on unlicensed AI technology until the very last moment and cough up if pushed to it (this is what happened in *Dolby v. Lava* in India, which we will discuss later). The rules of FRAND were made to combat these behaviours.⁸³³ For instance, the U. S. Department of Justice and USPTO have argued that injunctions are inappropriate where the implementer is able and willing to pay a FRAND royalty. On the flip side, a court could tell hold-out implementers to pay interim royalties instead of going for that quick

⁸³¹ *Royalty stacking in FRAND litigation – part one*, IAM (July 24, 2019), <https://www.iam-media.com/article/royalty-stacking-in-frand-litigation-part-one#:~:text=In%20SEP%20litigation,%20standard%20implementers,a%20problem> (last visited Aug. 7, 2025).

⁸³² Benjamin C. Elacqua et al., *Introduction to SEP & FRAND Issues*, Intellectual Property Law Firm | IP Attorneys | Fish & Richardson (Dec. 11, 2024), <https://www.fr.com/insights/thought-leadership/blogs/introduction-to-sep-frand-issues/> (last visited Aug. 7, 2025).

⁸³³ *Apple Inc. v. Motorola, Inc., No. 12-1548 (Fed. Cir. 2014)*, Justia Law, <https://law.justia.com/cases/federal/appellate-courts/cafc/12-1548/12-1548-2014-04-25.html#:~:text=Patent%20and%20Trademark%20Office,%20Policy,To%20be> (last visited Aug. 7, 2025).



injunction.⁸³⁴ The subtle balancing act between halting hold-up and abetting hold-out becomes trickier because of AI's hazy algorithms and rapid shifts in the market, with its dynamics.

Finally, the need for data in AI, algorithmic ambiguity, and swift changes are putting pressure on a static SEP/FRAND structure. Old-timer FRAND was moulded with telecom hardware; AI requires flexible and transparent licensing arrangements. As one analysis puts it, the intersection of AI and standards demands "reimagining" the governance of SEPs so that innovation is neither stifled nor hijacked.⁸³⁵ The next sections will analyse how different jurisdictions are confronting this conundrum.

COMPARATIVE LEGAL REGIMES: US, EU, AND ASIA

At least in the U.S., SEP-FRAND disputes are not treated as federal antitrust disputes and are viewed through a lens of contract and patent law. This is the situation adopted in the landmark case of *FTC v. Qualcomm*. There, Qualcomm licensed its cellular SEPs to phone makers only (not to rival chip suppliers) based on a 'no license-no chip' policy. In 2017, the FTC filed an antitrust complaint.⁸³⁶ A district court in California found that Qualcomm's conduct had anti-competitive effects and ordered injunctive relief. However, in 2020, the appeal was heard in the Ninth Circuit, which, without any dissent, found against Qualcomm in its view that it had no antitrust duty to license to its chipmaker competitors. Crucially for our discussion, the appeals court would find that any breach of FRAND commitments would have to be addressed through a contract law remedy or a patent law remedy, not through antitrust law. In its own words, it stated that violations of FRAND are best addressed as a matter of contract or patent law, not antitrust.⁸³⁷ Thus, there is a clear division under U.S. law: every

⁸³⁴ Benjamin C. Elacqua et al., *Introduction to SEP & FRAND Issues*, Intellectual Property Law Firm | IP Attorneys | Fish & Richardson (Dec. 11, 2024), <https://www.fr.com/insights/thought-leadership/blogs/introduction-to-sep-frand-issues/> (last visited Aug. 7, 2025).

⁸³⁵ András Jókúti, *Fundamental FRAND dependability: why standardizing technology is not just peanuts*, WIPO - World Intellectual Property Organization (Dec. 9, 2024), <https://www.wipo.int/web/wipo-magazine/articles/a-frand-in-need-why-establishing-standardized-technologies-is-so-complicated-69933#:~:text=SEPs%20protect%20inventions%20that%20are,where%20the%20second%20phase%20begins> (last visited Aug. 7, 2025).

⁸³⁶ Ralph E. Labaton & David Shotlander, *No FRANDS in Antitrust? Qualcomm's Rejection of FRAND Violations as a Predicate to an Antitrust Violation* - Haug Partners, Leading Law Firm | Haug Partners, <https://haugpartners.com/article/no-frands-in-antitrust-qualcomms-rejection-of-frand-violations-as-a-predicate-to-an-antitrust-violation-2/#:~:text=SSOs%20generally%20require%20participating%20patent,to%20make%20patents%20available%20to> (last visited Aug. 7, 2025).

⁸³⁷ Ralph E. Labaton & David Shotlander, *No FRANDS in Antitrust? Qualcomm's Rejection of FRAND Violations as a Predicate to an Antitrust Violation* - Haug Partners, Leading Law Firm | Haug Partners, <https://haugpartners.com/article/no-frands-in-antitrust-qualcomms-rejection-of-frand-violations-as-a-predicate-to-an-antitrust-violation->



refusal by a SEP holder to license on FRAND terms is not in itself a violation of the Sherman Act. This fits with the much broader principle enunciated elsewhere that FRAND undertakings given, in the main, to an SSO create private contractual rights but do not by themselves impose public duties on the patent owner.⁸³⁸ SEP injunctions in the U.S. are also handled under the eBay traditional four-factor test, with the FRAND commitment as one consideration among others. In another example, in *Apple v. Motorola* (Fed. Cir. 2014), the court upheld that Motorola's FRAND pledge was tantamount to prior acknowledgement that a reasonable royalty amounted to adequate compensation for its SEP.⁸³⁹ The district court had rejected the request by Apple seeking to enjoin Apple from selling products because Motorola had implicitly licensed any willing party.⁸⁴⁰ The Federal Circuit ruled that FRAND-encumbered patents should be enjoined only when the implementers decline a FRAND royalty or delay negotiations. In summary, the tendency in U.S. law is to protect willing licensees: an implementer sincerely seeking a license at a FRAND rate can usually avoid being enjoined, while one who unreasonably delays the negotiation may yet find itself prevented from practising the patent. This, however, aims to prevent patent hold-up, allowing the SEP owner recourse under contractual means (a remedy in damages or an order in specific performance of the license) if the implementers stray from the FRAND commitments.⁸⁴¹ For AI, the U.S. approach implies that much of the FRAND problem would remain in the area of private law. To pursue antitrust claims against any AI-related SEP practices, monopoly conduct within the traditional definition (as opposed to simply a breach of FRAND) would have to be demonstrated. Policymakers may also want to consider whether new antitrust guidance is needed that would address the peculiarities of AI (for example, algorithmic

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⁸³⁸ Ralph E. Labaton & David Shotlander, *No FRANDS in Antitrust? Qualcomm's Rejection of FRAND Violations as a Predicate to an Antitrust Violation* - Haug Partners, Leading Law Firm | Haug Partners, <https://haugpartners.com/article/no-frands-in-antitrust-qualcomms-rejection-of-frand-violations-as-a-predicate-to-an-antitrust-violation-2/#:~:text=SSOs%20generally%20require%20participating%20patent,to%20make%20patents%20available%20to> (last visited Aug. 7, 2025).

⁸³⁹ *Apple Inc. v. Motorola, Inc., No. 12-1548* (Fed. Cir. 2014), Justia Law, <https://law.justia.com/cases/federal/appellate-courts/cafc/12-1548/12-1548-2014-04-25.html#:~:text=Patent%20and%20Trademark%20Office,%20Policy,To%20be> (last visited Aug. 7, 2025).

⁸⁴⁰ *Apple Inc. v. Motorola, Inc., No. 12-1548* (Fed. Cir. 2014), Justia Law, <https://law.justia.com/cases/federal/appellate-courts/cafc/12-1548/12-1548-2014-04-25.html#:~:text=Patent%20and%20Trademark%20Office,%20Policy,To%20be> (last visited Aug. 7, 2025).

⁸⁴¹ *Apple Inc. v. Motorola, Inc., No. 12-1548* (Fed. Cir. 2014), Justia Law, <https://law.justia.com/cases/federal/appellate-courts/cafc/12-1548/12-1548-2014-04-25.html#:~:text=Patent%20and%20Trademark%20Office,%20Policy,To%20be> (last visited Aug. 7, 2025).



collusion) outside of the current framework.⁸⁴² As a legal baseline, in U.S. courts, parties will continue to negotiate and contest SEP licenses through the same process as they did before the emergence of AI, though with changes in how the data-centric application of AI fits within the patent portfolios. The SEP-FRAND regime of the EU is quite competition-law flavoured. The modern template is set by *Huawei v. ZTE* (2015), CJEU: before he can enjoin an SEP, the patent holder must notify the infringer of the infringing conduct and then offer him a particular licensing condition.⁸⁴³ The infringer must respond diligently with a counteroffer or provide security. This will thus be very much inspired by EU competition policy towards its end: the patentee could not just disable rivals from operation, and the implementer may not just ignore the offer. The CJEU clarified that courts should favour the process for obtaining a FRAND license over the granting of injunction relief. As noted by one commentator, the rules of *Huawei v. ZTE* thus "place heightened emphasis on the FRAND inquiry and prioritise good-faith negotiations," as opposed to making simple refusals to license an abuse of dominance.⁸⁴⁴ In practice, that means EU judges are likely to allow SEP injunctions only after rather extensive scrutiny of the negotiation history and procedural compliance. For example, if a patentee fails to lay out the terms associated with the license rate in his notice, an injunction is barred under *Huawei v. ZTE*.⁸⁴⁵ The two-step process pours competition-tinged controls into SEP enforcement. The EU also appreciates other facets of the SEP picture. The 2023 EU SEP Regulation, now withdrawn, would have institutionalised transparency even further; it envisaged having a public SEP registry, mandatory essentiality checks by EUIPO, and a process at the EU level for FRAND

⁸⁴² Ralph E. Labaton & David Shotlander, *No FRANDS in Antitrust? Qualcomm's Rejection of FRAND Violations as a Predicate to an Antitrust Violation - Haug Partners*, Leading Law Firm | Haug Partners, <https://haugpartners.com/article/no-frands-in-antitrust-qualcomms-rejection-of-frand-violations-as-a-predicate-to-an-antitrust-violation-2/#:~:text=SSOs%20generally%20require%20participating%20patent,to%20make%20patents%20available%20to> (last visited Aug. 7, 2025).

⁸⁴³ Chris Vale et al., *Standard Essential Patents in Southeast Asia*, Lexology (Feb. 4, 2025), <https://www.lexology.com/library/detail.aspx?g=458de21e-df75-4671-9910-3877280cce96#:~:text=The%20Huawei%20v,negotiations%20over%20competition%20law%20considerations> (last visited Aug. 7, 2025).

⁸⁴⁴ Chris Vale et al., *Standard Essential Patents in Southeast Asia*, Lexology (Feb. 4, 2025), <https://www.lexology.com/library/detail.aspx?g=458de21e-df75-4671-9910-3877280cce96#:~:text=The%20Huawei%20v,negotiations%20over%20competition%20law%20considerations> (last visited Aug. 7, 2025).

⁸⁴⁵ Chris Vale et al., *Standard Essential Patents in Southeast Asia*, Lexology (Feb. 4, 2025), <https://www.lexology.com/library/detail.aspx?g=458de21e-df75-4671-9910-3877280cce96#:~:text=The%20Huawei%20v,negotiations%20over%20competition%20law%20considerations> (last visited Aug. 7, 2025).



determination before litigation.⁸⁴⁶ Even though the regulation has now been withdrawn in 2025, it speaks volumes about EU policymakers' appetite for centralised procedures. Such rules, if revived, could have required SEP holders to prove their patents are genuinely essential, addressing the issue of a "laundry list" of self-declared SEPs, while making them a bit more efficient in licenses across EU markets.⁸⁴⁷ For now, however, Europe relies on competition law. Notably, EU competition authorities have pursued FRAND-related antitrust cases: the long-running cases of the EU Commission against Qualcomm, Samsung, and Motorola interrogated SEP licensing under antitrust rules.⁸⁴⁸ However, as in the U.S., courts in Europe generally stop short of deeming a mere breach of FRAND alone as illegal. Rather, they ensure compliance with FRAND through injunction rules and allow patent infringement suits with FRAND defences.

Many Asia-Pacific jurisdictions have adopted the EU model. For example, both Singapore and Malaysia have built in competition law in their FRAND disputes, as they demand that both sides undertake dealings in good faith. Indonesia, Thailand, Vietnam and several other jurisdictions have also indicated that they would not mind taking over the principles from *Huawei v. ZTE*.⁸⁴⁹ Overall, the EU perspective is not only about patent rights but to renegotiating the device from which patent owners hold exclusive control over the use of their inventions over licensees, such as from a market balance perspective, preserving innovation incentives and competition. This has also spread to other jurisdictions, as we will discuss.

By 2023, it had entered the speech recognition field. The jurisprudence of India's SEPs is changing rapidly, especially after 2017. The Supreme Court and Delhi High Court have lately pronounced landmark judgments on the FRAND. In the beginning, courts in India used to almost always permit

⁸⁴⁶ Ryan C. Richardson & Christopher R. O'Brian, *IP Hot Topic: European Commission Suddenly Withdraws Proposed SEP Regulation*, Sterne Kessler (Feb. 12, 2025), <https://www.sternekeessler.com/news-insights/client-alerts/european-commission-suddenly-withdraws-proposed-sep-regulation/> (last visited Aug. 7, 2025).

⁸⁴⁷ Ryan C. Richardson & Christopher R. O'Brian, *IP Hot Topic: European Commission Suddenly Withdraws Proposed SEP Regulation*, Sterne Kessler (Feb. 12, 2025), <https://www.sternekeessler.com/news-insights/client-alerts/european-commission-suddenly-withdraws-proposed-sep-regulation/> (last visited Aug. 7, 2025).

⁸⁴⁸ András Jókúti, *Fundamental FRAND dependability: why standardizing technology is not just peanuts*, WIPO - World Intellectual Property Organization (Dec. 9, 2024), <https://www.wipo.int/web/wipo-magazine/articles/a-frand-in-need-why-establishing-standardized-technologies-is-so-complicated-69933#:~:text=SEPs%20protect%20inventions%20that%20are,where%20the%20second%20phase%20begins> (last visited Aug. 7, 2025).

⁸⁴⁹ Chris Vale et al., *Standard Essential Patents in Southeast Asia*, Lexology (Feb. 4, 2025), <https://www.lexology.com/library/detail.aspx?g=458de21e-df75-4671-9910-3877280cce96#:~:text=The%20Huawei%20v,negotiations%20over%20competition%20law%20considerations> (last visited Aug. 7, 2025).



the injunction to be granted in favour of SEP owners unless the implementers proved their willingness to obtain licenses from them. The recent judgments have mainly included *Nokia v. Guangdong OPPO* (2022) and many others on a similar topic.⁸⁵⁰ They embraced the "willing licensee" concept, which posits the following: an implementer is presumed unwilling if it ships products without a license, and the court orders it to deposit an interim royalty so that it can continue selling.⁸⁵¹ The case of *Nokia v. OPPO* is where the quote "No person who is unwilling to take a license from the holder of a SEP on FRAND terms is entitled to use the SEP" beautifully comes from. So India essentially turned the logic from *Apple v. Motorola* around, put the burden on the implementer to show he has made serious attempts to achieve a FRAND license to obtain a FRAND defence.

Recent verdicts also portray India's stance on discrimination. It has also been noted by the courts that, in conjunction with either allowing different SDOs to exist quite likely that if the SEP holder charges similar rates from its licensees, it will respect such terms. For example, a court employed the previous license payments paid to Ericsson by other companies to benchmark royalties, and then it indicated that matching those fees, or non-discriminatory terms, would appear to render the terms acceptable. The Delhi High Court orders in *Ericsson v. Intex* and *Nokia v. OPPO* imposed license deposits on the basis of previous comparable agreements.⁸⁵² This fact indicates that Indian judges seem to focus more on the parity with existing deals, which is one core principle of FRAND, than on other factors.

India also steps up justice regarding SEPs. In the case of *Dolby Laboratories v. Lava International*, decided in July 2025, the court applied this novel tactic-inhibiting hold-out utilising a conditional injunction, whereby the court allowed Lava to continue selling infringing devices on the basis of depositing huge royalties (around ₹20 crore) in escrow.⁸⁵³ The court found Lava to have engaged in egregious holdout

⁸⁵⁰ *Ericsson and Nokia v Oppo signal that non-discriminatory terms are key concern for Indian courts*, IAM (Mar. 24, 2023), <https://www.iam-media.com/hub/sepfrand-hub/2022/article/ericsson-and-nokia-v-oppo-signal-non-discriminatory-terms-are-key-concern-indian-courts#:~:text=,licence%20available%20on%20FRAND%20terms> (last visited Aug. 7, 2025).

⁸⁵¹ *Ericsson and Nokia v Oppo signal that non-discriminatory terms are key concern for Indian courts*, IAM (Mar. 24, 2023), <https://www.iam-media.com/hub/sepfrand-hub/2022/article/ericsson-and-nokia-v-oppo-signal-non-discriminatory-terms-are-key-concern-indian-courts#:~:text=,licence%20available%20on%20FRAND%20terms> (last visited Aug. 7, 2025).

⁸⁵² *Ericsson and Nokia v Oppo signal that non-discriminatory terms are key concern for Indian courts*, IAM (Mar. 24, 2023), <https://www.iam-media.com/hub/sepfrand-hub/2022/article/ericsson-and-nokia-v-oppo-signal-non-discriminatory-terms-are-key-concern-indian-courts#:~:text=,licence%20available%20on%20FRAND%20terms> (last visited Aug. 7, 2025).

⁸⁵³ Gaurav Mishra, *Dolby v. Lava: INR 20 Crore Deposit Ordered in SEP patent infringement case* | *Intellopedia*, Intellopedia (July 23, 2025), <https://www.bananaip.com/intellopedia/dolby-v-lava-inr-20-crore-deposit-ordered-in-sep-patent-infringement-case/> (last visited Aug. 7, 2025).



behaviour by stating frivolous claims of invalidity and delaying talks. This "security deposit" mechanism provides the unique Indian twist to protect SEP holders from being exploited, while implementers will be allowed to operate. It is practically combining FRAND and antitrust thinking in one order.

Overall, then, India is now one of the hottest markets for SEP litigation worldwide. The government and the judiciary are still developing formal guidelines; however, courts have already paved the way forward to combine international FRAND norms and local needs. One constant message is that Indian licensees must negotiate (not stonewall) to claim FRAND safe harbour, and SEP holders cannot treat India as a monopoly (they must apply the same rates as elsewhere).⁸⁵⁴ Thus, SEP disputes in India quickly go into licensing or trial rather than open-ended injunction fights. That creates both opportunity and risk for AI-driven enterprises. India's readiness to give life to FRAND can insulate local implementers from extortionate rates, but cost issues and time consumption problems weigh heavily against large SEP owners when they add litigation there.

In other South Asian jurisdictions, SEP issues are still in their infancy outside of India. Even countries like Pakistan and Bangladesh do not have any substantial SEP case law; most of their patent systems are geared towards compulsory licenses for pharmaceuticals, with little regard to complex ICT standards. They do operate in these markets (e.g., mobile phone selling, telecom gear), so practically FRAND commitments apply. In the future, South Asian courts will probably follow either the "willing licensee" model of the U.S. or the EU/Huawei model, depending on local law. Absent clear local guidance, many disputes may go to arbitration or be settled on international terms.

Southeast Asia and Asia-Pacific

Many of the ASEAN countries and courts in the Asia-Pacific have recently begun adjudicating SEP cases. Most analyses show that they are slowly adopting the *Huawei vs ZTE* approach. For example, the courts in Singapore, Malaysia, Indonesia, Thailand and Vietnam are said to have adopted *Huawei v. ZTE-like* procedures about SEP injunctions.⁸⁵⁵ The Philippines, however, with its closer historical

⁸⁵⁴ *Royalty stacking in FRAND litigation – part one*, IAM (July 24, 2019), <https://www.iam-media.com/article/royalty-stacking-in-frand-litigation-part-one#:~:text=In%20SEP%20litigation,%20standard%20implementers,a%20problem> (last visited Aug. 7, 2025).

⁸⁵⁵ Chris Vale et al., *Standard Essential Patents in Southeast Asia*, Lexology (Feb. 4, 2025), <https://www.lexology.com/library/detail.aspx?g=458de21e-df75-4671-9910-3877280cce96#:~:text=The%20Huawei%20v,negotiations%20over%20competition%20law%20considerations> (last visited Aug. 7, 2025).



ties to U.S. law, has arguably been less prohibitive of injunctions (akin to *Apple v. Motorola*). In general, though, the region does tend to prioritise good-faith negotiation and transparency.⁸⁵⁶ Significantly, some of those countries (e.g., Singapore and Malaysia) have already issued antitrust guidelines on SEPs, thus implicitly creating multiple forums for them: an implementer might choose to prosecute infringement or file competition complaints if certain rates are unfair.

China: China has emerged as the most proactive economy on SEP licensing among the Global South economies. An increased number of cases on SEPs have been handled by the Chinese courts, which established their global FRAND rates in many cases. In *OPPO v. Nokia* (Chongqing Higher People's Court, 2022), the first case in China to set up a globally FRAND license, the court controversially set lower royalty rates for China and other developing countries (around 0.477% for 4G, 0.707% for 5G) than for "developed" markets (0.777% and 1.151%, respectively).⁸⁵⁷ It justified this by referring to China's GDP and mobile base development without any foreign precedents and without contractual MFN constraints. It has been criticised as legally tenuous: it arguably violates TRIPS non-discrimination and EU anti-MFN principles.⁸⁵⁸ In other words, China is keen to protect its domestic industry through the so-called patriotic FRAND rates, applying competition and civil law norms, typically found in China, rather than strictly following ETSI or foreign FRAND guidelines.

Importantly, China's regulatory agencies also reformulate their antitrust stances on SEPs. Late in 2024, the State Anti-Monopoly Bureau (SAMR) promulgated its new guidelines specific to the licensing of SEPs to show that SEP agreements must be subject to the requirements of competition law. The guidelines favour the ex-ante disclosure while steering SEP holders away from tying or exclusionary practices, merging IP law and antitrust supervision. This was also a response to high-profile cases against companies like Qualcomm and to defend Chinese tech champions.

⁸⁵⁶ Chris Vale et al., *Standard Essential Patents in Southeast Asia*, Lexology (Feb. 4, 2025), <https://www.lexology.com/library/detail.aspx?g=458de21e-df75-4671-9910-3877280cce96#:~:text=The%20Huawei%20v,negotiations%20over%20competition%20law%20considerations> (last visited Aug. 7, 2025).

⁸⁵⁷ Mark Cohen, *Oppo v. Nokia in Context*, China IPR - Intellectual Property Developments in China (Dec. 18, 2023), <https://chinaipr.com/2023/12/18/oppo-v-nokia-in-context/#:~:text=lower%20Chinese%20rate,%20in%20my,this%20approach%20include%20the%20following> (last visited Aug. 7, 2025).

⁸⁵⁸ Mark Cohen, *Oppo v. Nokia in Context*, China IPR - Intellectual Property Developments in China (Dec. 18, 2023), <https://chinaipr.com/2023/12/18/oppo-v-nokia-in-context/#:~:text=lower%20Chinese%20rate,%20in%20my,this%20approach%20include%20the%20following> (last visited Aug. 7, 2025).



Altogether, the Asia region shows a variety of approaches from the strict injunction rule-making in India, global FRAND-setting in China, to procedural license-checking in ASEAN. This heterogeneity means an SEP holder or user will be compelled to navigate many regimes. For one such company innovating in AI (say an Indian startup or a Chinese smartphone maker), that means FRAND negotiations can entail confronting different legal standards and different bargaining chips, a complex negotiation matrix.

AI, ANTITRUST, AND MONOPOLIES: RISKS FOR THE GLOBAL SOUTH

Primarily concerned with patent matters, the emergence of AI creates new antitrust dilemmas-AI in developing areas where the market power imbalance is glaring.

Algorithmic Collusion

Such advanced AI systems (pricing algorithms, for instance) might inadvertently collude. As legal academics note, autonomous pricing algorithms learn how to implement collusion schemes without even the need for communication between firms. AI pricing tools, for instance, by different competing telecom suppliers, might jointly "learn" to raise supra-competitive prices, and one will be able to point a finger at an active 'collusion' agreement between them. It is feared that such 'self-learning' forms of collusion would therefore be hard to identify and prove in a court of law under the traditional antitrust approach. And thus, enforcing it is even more difficult in the Global South, in India or Southeast Asia, the competition authorities may simply lack the technical know-how or resources to identify an algorithmic cartel.⁸⁵⁹ Such risk gets aggravated in concentrated markets (telecom equipment, AI cloud services) where the market is dominated by less than a handful of big players (usually global Western or Chinese firms). When tacit coordination takes place, AI tools may well be generating uniformly high royalties or licensing terms across competition, directly contradicting the FRAND rationale of being "Reasonable."⁸⁶⁰

⁸⁵⁹ Grace Zhao & Dr Sven-Michael Werner, *Brief Analysis on Artificial Intelligence and Antitrust in China*, Passle (June 17, 2025), <https://competitionlawinsights.twobirds.com/post/102kfld/brief-analysis-on-artificial-intelligence-and-antitrust-in-china#:~:text=The%20current%20challenge%20facing%20antitrust%20enforcement,nor%20is%20it%20biased%20to> (last visited Aug. 7, 2025).

⁸⁶⁰ Grace Zhao & Dr Sven-Michael Werner, *Brief Analysis on Artificial Intelligence and Antitrust in China*, Passle (June 17, 2025), <https://competitionlawinsights.twobirds.com/post/102kfld/brief-analysis-on-artificial-intelligence-and-antitrust-in-china#:~:text=The%20current%20challenge%20facing%20antitrust%20enforcement,nor%20is%20it%20biased%20to> (last visited Aug. 7, 2025).



Data Monopolies

Data is the prime input for AI. Firms controlling unique high-quality datasets (such as location data, health data, and large annotated datasets) gain an edge that may be deemed proprietary. Such benefits may spill over into SEPs when, for example, an AI patent appears "less essential" if the contender had data-driven alternative methods available to it. To present a more tangible situation, consider an AI feature of a standard (such as image recognition), where Company A has the only dataset to train the models.⁸⁶¹ If Company A has patents in this area, it can increase the royalty or deny a license to its competitors, knowing fully well that these competitors find it extremely difficult, if not impossible, to replicate the dataset. A recent analysis warns that "insurmountable advantages" for incumbents are created from Big Tech's vast datasets acquired through scraping or platform dominance. For an outlet-based firm coming up in developing nations, either buying or accessing such data may be virtually impossible or simply too expensive. This undermines the fairness of the standardisation: a patent that is stated to be "essential" might hold "market power" due to undisclosed data leverage.⁸⁶² Currently, this dimension is not captured within FRAND rules, leaving firms in the Global South susceptible to being locked into suboptimal deals or impeded from innovating by data barriers.

Asymmetric Enforcement

Courts and regulators in the developing world face a lack of capacity to tackle aggressive licensing practices. A few South Asian countries have not been known for a robust record of SEP litigation or antitrust enforcement. However, the true "giants" in this game, SEP owners, are global entities and deep-pocketed. The asymmetry means that local implementers may feel coerced into accepting terms and conditions that leave their interests unprotected. For example, a Pakistani manufacturer might be deterred from suing a foreign SEP holder for FRAND terms due to complex legal challenges. Developing nations, once again, commonly lack adequate patent examination or representation in the realm of standards-setting and might not even have full visibility as to what patents are essential. On the whole divide is oblique: with powerful SEP owners' negotiating from strength, the smaller players have very little power.

⁸⁶¹ Courtney Radsch, *Dismantling AI Data Monopolies Before it's Too Late* | *TechPolicy.Press*, Tech Policy Press (Oct. 9, 2024), <https://www.techpolicy.press/dismantling-ai-data-monopolies-before-its-too-late/> (last visited Aug. 7, 2025).

⁸⁶² Courtney Radsch, *Dismantling AI Data Monopolies Before it's Too Late* | *TechPolicy.Press*, Tech Policy Press (Oct. 9, 2024), <https://www.techpolicy.press/dismantling-ai-data-monopolies-before-its-too-late/> (last visited Aug. 7, 2025).



These risks point toward a much broader antitrust challenge

AI can cement monopoly power in a way that traditional antitrust oversight would be inadequately prepared to deal with, especially in the Global South. If paired with non-transparency in SEP practices, they can impair competition and innovation. Various ways exist in which AI might facilitate tacit collusion, with SEP holders perhaps being able to extract supra-FRAND from all the major implementers beneath the radar. Conversely, firms with critical datasets may ask royalties closer to what has been seen in hold-up situations under the cover of "patent" rights. With competition enforcement being lopsided, such anti-competitive outcomes may remain unchecked.

Policy Safeguards

In order to reduce the risks posed by these threats to the Global South, a number of antitrust-oriented policies seem desirable.

Mandatory Access to Data and Licensing

FRAND standards should be extended to some critical AI datasets or input data. If a particular standard is dependent on data (e.g., a mapping standard dependent on geographic data), then that data should be required to be licensed on FRAND-like terms or made available under these transparency norms. This could mean an international push (through WIPO or WTO) for a "Data FRAND" principle, making sure that implementers can access the needed data on low-cost terms. For example, data used in public standards could be mandated by governments to be deposited in a central repository accessible by all innovators or could require licensing of datasets under standard contracts. Policy in this way can try to shut out exclusive data control over key datasets. This is similar to the approach some jurisdictions follow regarding genome databases (asking for the sharing of genetic data under fair conditions).

Algorithmic Competition Enforcement

The competition authorities should investigate algorithmic collusion and other AI abuse in an active way. In doing so, the creation of expertise in the field of digital economics could be coupled with the introduction of amendments to the antitrust laws, if necessary, to include unilateral algorithmic conduct. Regional bodies (like SAARC) or global forums (with ICN, OECD) could assist South Asian regulators by building best practices for AI collusion cases. Further, regulators might ask firms to certify that their pricing algorithms are not in coordination with their competitors or to undertake ex-



post algorithmic audits. Such measures would deem the AI pricing-based licensing of SEPs incompatible with the antitrust laws.

International Dispute Mechanisms. SEP disputes are often out of reach for small countries. One remedy could be the establishment of international arbitrations or dispute resolution frameworks within institutions like the WTO or WIPO, precisely for FRAND disagreements. As an example, the now-abandoned EU proposal suggested arbitration at the EUIPO. A similar construct under WIPO could establish "FRAND arbitration" accessible to firms from developing countries. This would lessen the burden of litigation costs and assure equitable enforcement of FRAND commitments throughout the world. In that WTO context, extending the TRIPS Agreement could bind members to respect SEP/FRAND standards (TRIPS is silent on SEPs at the moment). A multilateral program for SEP licensing, much like treaties on patent exhaustion, could empower Global South actors caught in the power imbalance.

Regulatory Guidance and Transparency

Clear guidelines on SEPs and AI should be prepared by the national patent offices and competition authorities of the Global South. For instance, the Competition Commission of India could publish guidelines related to the interpretation of FRAND and data concerns. Likewise, patent offices across South Asia could create and maintain publicly accessible databases for SEPs (as proposed by the EU). Transparency tools (FRAND rate calculators, patent claim charts) could enhance the understanding of licensing. These actions will eliminate uncertainty and propel the negotiations into a more level playing field.

RECOMMENDATIONS

WIPO/WTO Initiatives

International fora should change norms with AI. WIPO could set up a working group to specify AI "essentiality" standards- i.e., when an AI component (algorithm, data set, model) qualifies as an SEP. Also, a global SEP registry (akin to the one proposed by the EU) would database declared SEPs and possibly include data-related information (e.g., global vs. local patent families). WTO conversations around digital trade could smartly align and include a discussion regarding fair access to AI data under the TRIPS Agreement. Effectively, carve out what looks like FRAND obligations for AI-tethered IP in international arrangements, such as for databases and algorithms.



International Patent Offices

The Southern patent offices must revise examination and licensing procedures. Consider, for example, India's or the other developing countries' patent office's making evidence of essentiality mandatory in the SEP declaration. Fast-track processes for SEP portfolio review, as well as publication of search files, can be integrated. Importantly, it could give a differential FRAND, allowing the lower royalty ceilings of domestic manufacturers or small-scale innovators in developing countries. (China already practices some sort of two-tier rates in an implicit form; allowing for varying rates for developing countries could be a more open and WTO-compatible solution.) In order to reduce potential hold-up risks, it could support ex-ante negotiation methods, in which a potential implementer would seek a provisional FRAND offer from the patent holder before commercialising the product.

Competition and Regulatory Authorities

Competition agencies must remain active to AI-specific risks. In the EU, national competition authorities have followed *Huawei v. ZTE* with national guidelines. South Asian regulators should issue similar guidance on algorithmic collusion and the abuse of digital monopoly. For instance, the Indian Competition Commission might say that the kind of algorithmic pricing that results in identical outcomes among competitors can also be examined as a concerted practice. They could also encourage open AI research, for example, providing an antitrust safe harbour for open-source AI works, which provide an alternative to closed-source solutions burdened by SEPs. Policymakers, by openly supporting open-source AI standards, lessen dependence on expensive, patented solutions.

Facilitating Licensing Flexibility

This should call for dynamic licensing models supported by all stakeholders. Royalties should be based on AI model performance or usage metrics, while upfront fees will decrease as technology progresses. For example, an API service to an AI program could be charged per call as opposed to being charged per device, in which case, it reflects what value it provides under use. Such models would find an express endorsement in a FRAND framework. Another idea involves escrow payments: courts could require implementers to directly pre-deposit funds into escrow, with these funds either going to the



patentee or being returned to the implementer depending on a future FRAND determination (similar to *Dolby v. Lava*).⁸⁶³

Capacity Building in the Global South

Finally, the developing countries must invest in legal capacity development relating to SEPs and AI. Regional judicial trainings and public-private partnerships, funded, for instance, by WTO development initiatives in a "FRAND Knowledge Hub," will assist local judges and lawyers to become conversant with such complex matters. Translating and disseminating case studies from India or China would ensure that courts from Pakistan, Bangladesh, or Nepal are not in blind oblivion over recent developments. International donors may intervene to set up antitrust AI units sharing the workload of the competition commissions.

CONCLUSION

The development of artificial intelligence has necessitated a complete reconsideration of the current structure of the SEP or FRAND governance framework. The licensing arrangement through patents was traditionally case-by-case, specific, and stored on discrete technologies; that notion does not hold with AI because it depends on the dynamic attributes of data. The Global South is therefore faced with a double-edged sword challenge: while trying to protect nascent AI industries, they also have to contend with very powerful global patent holders. Analysis of the SEPs will show that without reforms, free access licensing will lock in inequalities where big firms will drive innovations and smaller firms incur a higher toll or exclusion. But these are not elusive. Enhanced FRAND clarification to accommodate AI will improve transparency and embedded competitive safeguards, which will allow policymakers to guarantee that AI innovation is progressive for all. Recommendations that must be among the finer from essentiality standards spearheaded by the WIPO to competition agencies policing algorithmic collusion would all contribute towards moving FRAND into the digital age. Lastly, collaboration among IP experts, technologists, and economists will require be interdisciplinary approach. The Global South has to be aggressive; countries should design AI-optimised licensing ecosystems instead of inheriting archaic patent law. In putting the fairness of standards for AI on centre stage, we may tackle data monopolies and unfairness in algorithms, while maintaining the

⁸⁶³ Benjamin C. Elacqua et al., *Introduction to SEP & FRAND Issues*, Intellectual Property Law Firm | IP Attorneys | Fish & Richardson (Dec. 11, 2024), <https://www.fr.com/insights/thought-leadership/blogs/introduction-to-sep-frand-issues/> (last visited Aug. 7, 2025).



incentives of SEPS holders without compromising competition. Good policy design could see that FRAND holds onto its original purpose of fostering interoperability and innovation in an AI world without creating fresh digital divides.



CHAPTER 27

THE SOVEREIGN SEEDS: CRITICAL ANALYSIS ON INTERFERENCE BETWEEN THE PPV & FR ACT AND BIOTECHNOLOGY PATENT CLAIMS

- Pradyumna R Kallavi*

ABSTRACT

In India, the Protection of Plant Varieties and Farmers' Rights Act, 2001, was enacted as sui generis legislation following Article 27.3(b) of the TRIPS Agreement, which obliges member states of the World Trade Organization (WTO) to establish legal mechanisms for the protection of plant varieties. It was a pivotal milestone for the conservation and sustainable utility of plant genetic resources. The Act confers legally recognized rights to farmers and plant breeders for "conserving, improving and making available plant genetic resources", hence the Act not only recognises a farmer as a cultivator but also as an innovator. However, the Act's coexistence with the Indian Patents Act, 1970 has led to areas of jurisdictional and provisional overlap, particularly concerning biotech patent claims and the protection of plant varieties. This stiffness was notably highlighted in the PepsiCo case. The balance between the exclusive interests of breeders and corporations with the traditional rights of farmers is an integral part of this statute, but can be seen lacking due to the overlap. This policy paper delves into the concept of licensing of a variety of plants by a corporation or a company, navigating through legislatures, judicial interventions, and technological advancements. Albeit section 3(j) of the Patent Act explicitly excludes patenting of plants and animals in their entirety or any part thereof, some exceptions can be made if the process involves significant human intervention, paradoxically undermining the main aim of the provision. This paper expounds on landmark legislations and precedents which give effect to the right of patenting to the breeders which initiate biodiversity and international ties & bonds, as well as provides a doorway to farmers to explore and monetize yield through varieties of portfolios available.

KEYWORDS: PPV&FRA, Indian Patents Act 1970, Biotech Patent Claims, Licensing of Variety of Plants, TRIPS

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INTRODUCTION

The Plant Varieties Protection and Farmers' Rights Protection Act, 2001 preserves the rights of farmers to save, use, sell and exchange the farm harvest. The Act also assures the seeds bought by the farmers are of good quality. It is applicable to all farmers in India and over 12 species are included in the ambit of this Act. The criteria for granting Protection of plant varieties (PPV) laws allow breeders to protect varieties with very similar features, which means the system have a tendency be driven by commercial considerations of product differentiation and planned obsolescence rather than genuine improvements in agronomic characteristics. Similarly, UPOV-type uniformity (and stability) requirements exclude local varieties developed by farmers who are more genetically divergent, and less stable. However, these features are those that make them more adaptable and suited to the agro-ecological conditions on which most destitute farmers live. This paper attempts to analyse the overlapping of this Act with the provisions of the Patent Act, 1970. *Chapter I* sets to discuss the history and evolution of the PPV&FRA and it's international standing in today's world. *Chapter II* traverses through the challenges for intellectual property in the field of biotechnology, influence of IPR in biotechnology. Along with these lines, conflict between PPV&FRA and patent claims in biotechnology and the legislative and technological strides pose challenge to the delicate legal equilibrium. Beyond the statutory anomalies, I scrutinize the evolution of registration procedures of plant varieties through established precedents and understandings of renowned justices, in *Chapter III*. In the *Final Chapter*, I discuss the threats and challenges posed by these anomalies, including the loopholes and inaccuracies exploited by corporate personnels, which dissolves the whole purpose of the PPV&FRA. The multifaceted nature of the biotech patent claims are laid bare, culminating in a nuanced overview that sets the stage for my conclusion, answering the question set out in the title of the paper whether the sui generis legislation is just inoperable and is inferior to biotech claims and a sham in the name of farmers' right recognition.

HISTORIC PERSPECTIVE AND OBJECTIVES OF PPV&FRA

Sui Generis Legislation in India

Many developing countries are notably agricultural economies and such economies are dependent upon farmer-produced seed varieties that are both preserved and further adapted to their local growing conditions by small-scale farmers. Developing countries with such an economy want to acknowledge the rights of farmers for their contribution to crop preservation and development and the imparting



of their knowledge on adaptive qualities. This also encourages farmer-to-farmer exchange of new or foreign plant varieties that are modified and adapted to the local growing conditions. As a result, some developing countries have chosen a sui generis system of plant protection that is not compliant with UPOV. The system allows farmers to make improvements on the seed varieties so that the plant adapts to the local climate and soil to provide optimum yield.⁸⁶⁴

PPV&FRA, 2001

The Indian Patents Act, 1970 (as amended in 1999, 2002 and 2005) excluded ‘plants and animals in whole or any part thereof other than microorganisms but including seeds, varieties and species and essentially biological processes for production or propagation of plants and animals’ from patentability⁸⁶⁵. Given the explicit exclusion of plant varieties from the scope of patentable subject matter, India was obliged to guard these under a sui generis system as per the mandates of Article 27.3(b) of TRIPS. In furtherance of its obligations under Article 27.3(b)⁸⁶⁶, India enacted the PPV&FR Act (herein referred to as ‘the Act’) in 2001.

The TRIPs agreement states that the countries can protect plant varieties through a patent system. The Act provides a framework for intellectual property for a specific plant variety and protects it. Such rights are identified as Plant Variety Rights or Plant Breeder’s Right. The period of protection of the plant like trees and vines is 18 years, which is renewable after 9 years and for other crops it is 15 years, which is renewable after 6 years. In case of extant varieties, the term of protection is 15 years from the date of the notification.⁸⁶⁷

International covenants regarding Protection of Plant Varieties

India is participant to both Conventions on Biological Diversity (CBD) and the World Trade Agreements (under the WTO); and had joined the respective intergovernmental conferences or framework agreements from the inception of these conventions. Though India did not participate in the initial session of the Convention of the Union for Protection of New Varieties of Plants (UPOV), 1961 as it was a regional initiative taken by European nations; it nevertheless took note that this

⁸⁶⁴ Deepa Goel, Shomini Parashar, Intellectual property rights, biosafety, and bioethics 104-105 (Always learning, 1st edition) (2013)

⁸⁶⁵ Section 3 of the Patents Act, 1970, The Patents (Amendment) Act, 2005, published as law in the Gazette of India on 5 April 2005.

⁸⁶⁶ TRIPs agreement

⁸⁶⁷ The Protection of Plant Varieties and Farmers’ Rights Rules came into being in 2003 and the Protection of Plant Varieties and Farmers’ Rights Regulations in 2006, Act No 53 of 2001 (30 October 2001).



development will have global significance. This paved the path for the grant of IPR titles to the breeders of commercially novel, discrete, uniform and stable plant varieties having a unique denomination⁸⁶⁸. The GOI constituted a Seed Review Team (SRT) in October, 1967⁸⁶⁹, the policies formed and suggested by this committee facilitated Indian seed industries to be more customer oriented and competitive. Later first draft of the legislation on plant variety protection was prepared in Indian Council of Agricultural Research (ICAR) in 1993. After going through various scrutiny and discussions in the parliament The Act we identify today as PPV&FRA was systematised and enacted.

CHALLENGES FACED BY INTELLECTUAL PROPERTY IN BIOTECHNOLOGY

Patenting a Life Form

Any form of living organism was not patentable until the first patent application was filed over Bursitis vaccine, which was rejected by the Patent office claiming that the application was to patent a living organism which did not fall within Section 2(1) (j) of the Patent Act 1970. But Calcutta High Court ruled out the rejection and directed re-examination of the application in light of court's observation eventually the patent was finally granted⁸⁷⁰. This decision was a landmark in biotechnology patents. It opened a gateway for patenting in the fields of Biotechnology, microbiology, and the pharmaceutical industry, becoming a bedrock precedent unlocking research opportunities on animals, humans, and plants legally in India. but additionally, patenting life form not only merits researchers and plant breeders but also triggers some religious and ethical problems.

Albeit the Patent Act explicitly excludes patenting of plants and animals in their entirety or any part thereof, some exceptions can be made if the process involves significant human intervention⁸⁷¹ like synthetically created cDNA⁸⁷² and man-made bacterium was also held to be patent-eligible⁸⁷³. In subsequent cases court held the inventions cannot be countenanced merely because the organism specified in the sequence listing is homo sapiens. Such conclusion would be justified only if the

⁸⁶⁸ The International Union for the Protection of New Varieties of Plants (UPOV), Geneva, The 1991 Act of the UPOV Convention.

⁸⁶⁹ The Seed Review Team 1967 Report, Vol I & II, Delhi, Manager of Publications, 1968, p. 234; Committees and Commissions in India in 1947-1973, Vol 8, 1967, pp. 239-245 (SRT 1967 Report, 1968 Vol. II, Para 6.42 - 6.44) Concept Publishing Co, New Delhi.

⁸⁷⁰ DIMMINACO A.G. v. Controller of Patent Design, (2002) I.P.L.R. 255 (CAL)

⁸⁷¹ Diamond vs Chakraborty, 447 U.S. 303

⁸⁷² Molecular Pathology et al v. Myriad Genetics et al, 133 S.Ct. 2107 (2013)

⁸⁷³ Diamond v. Ananda M. Chakrabarty, 1980 SCC OnLine US SC 128...



appellant had discovered/found a hitherto unknown entity and isolated it from nature⁸⁷⁴ but if the invention like gene, DNA, plant variety are not new but have no claims over them some corporation or company can't barge in and claiming those as their invention⁸⁷⁵. Hence it became necessary to regulate patenting practices and implications in emerging international markets⁸⁷⁶ so there is no exploitation or misuse of the exceptions laid down by the legislation and court of law.

Linkage among Traditional Knowledge, IPR And Biotechnology.

Understanding the uses of biological resources such as plants, animals, and microorganisms is crucial to optimise yield. Indigenous communities hold essential knowledge about these resources in their local ecosystems. Unfortunately, some vested interest groups have unethically arrogated this traditional knowledge and sought protection through various modes of IPR, leading to significant challenges such as reduced agrobiodiversity, genetic erosion, and the loss of traditional varieties. Addressing these issues is essential for preserving cultural heritage and biodiversity⁸⁷⁷.

Nuziveedu vs. Monsanto

In the landmark case the court ruled once Monsanto sell transgenic seeds to Indian seed companies for use as initial varieties for creating new varieties, they cannot claim patent rights on subsequent seeds produced by farmers and breeders using essentially biological processes⁸⁷⁸. For that, it must rely on the provisions of benefit sharing under the PPV&FR Act⁸⁷⁹. In this case the patent right claims were upon the patented gene incorporated into seeds and not on the seeds per se. Hence PPVFR Act and benefit sharing with reference to this patent were held irrelevant⁸⁷⁹. But this raises a question that once a patented gene has been backcrossed into a seed or a plant variety, can a third party use the patented gene in his favour or is this an infringement of the patent holder's right and constitutes infringement. Even though the court ruled in favour of farmers this conflict in the statutes is still in question.

Patentable subjects in biotechnology

⁸⁷⁴ Immunas Pharma, Inc v. Assistant Controller of Patents and Design (T), 2024 SCC OnLine Mad 480

⁸⁷⁵ D'Arcy v Myriad Genetics Inc [2015] HCA 35

⁸⁷⁶ Novartis Vs Union of India, (2013) 6 SCC 1

⁸⁷⁷ Asha Vijay Durafe, Dhanashree K. Toradmalle, Intellectual property rights, 63-64 (Wiley, 1st edition) (2021)

⁸⁷⁸ Monsanto Technology LLC & Ors. vs. Nuziveedu Seeds Ltd. & Ors., CS(COMM) 132/2016. Order dated March 28, 2017.

⁸⁷⁹ Monsanto Technology LLC & Ors. vs. Nuziveedu Seeds Ltd. & Ors., CS(COMM) 132/2016. Order dated March 28, 2017.



The U.S. Supreme Court in the case of *Diamond v. Chakrabarty* held that “A live, human made micro-organism is patentable subject matter under the law⁸⁸⁰ and the micro-organism in question constitutes a ‘Manufacture’ or ‘composition of matter’ within the statute⁸⁸¹”

- i. Method for curative, prophylactic, diagnostic, medicinal or other plant care (to free them from diseases and plagues)⁸⁸².
- ii. Process/method for the preparation of genetically modified organisms (GMOs) Vaccines were considered patentable as living beings of artificial origin such as micro-organisms⁸⁸³.
- iii. Biological material such as recombinant DNA, plasmids and their manufacturing processes are patentable on condition that they are generated by substantial human intervention⁸⁸⁴.
- iv. Gene sequences, DNA sequences are not patentable for lack of inventive step and industrial application without having discussed their functions⁸⁸⁵.
- v. Processes involving micro-organisms or creating chemical compounds using certain microorgan-isms are patentable.⁸⁸⁶

CONFLICT BETWEEN PPV&FRA AND BIOTECHNOLOGY PATENT CLAIMS

The Indian Patents Act and the Protection of Plant Varieties and Farmers' Rights Act (PPV&FRA) may overlap with each other regarding plant-related inventions. The Patents Act permits patents on specific biotechnological inventions, while the PPV&FRA is enacted to protect new plant varieties and the rights of farmers.

This overlap can lead to legal clashes when a plant variety developed using a patented gene is also registered under the PPV&FRA. Such situations raise pivotal questions about the rights of both the patent holder and the plant breeder. The Indian Patents Act and the Protection of Plant Varieties and Farmers' Rights Act (PPV&FRA) create a complex legal setting for plant-related inventions. The

⁸⁸⁰ Title 35 U.S.C. § 101

⁸⁸¹ *Diamond v. Chakrabarty*, 447 U.S. 303 (1980)

⁸⁸² *Diamond v. Chakrabarty*, 447 U.S. 303 (1980)

⁸⁸³ *Diamond v. Chakrabarty*, 447 U.S. 303 (1980)

⁸⁸⁴ *Diamond v. Chakrabarty*, 447 U.S. 303 (1980)

⁸⁸⁵ *Diamond v. Chakrabarty*, 447 U.S. 303 (1980)

⁸⁸⁶ *Diamond v. Chakrabarty*, 447 U.S. 303 (1980)



Patents Act allows for patents on biotechnological innovations, including genetically modified organisms⁸⁸⁷, while the PPV&FRA focuses on protecting new plant varieties and farmers' rights⁸⁸⁸.

This overlap can lead to conflicts, particularly when a plant variety developed using a patented trait is registered under the PPV&FRA. Such situations raise questions about the rights of patent holders contrasted with those of plant breeders, potentially resulting in legal wrangles. moreover, farmers who rely on traditional knowledge may find themselves caught in these legal intricacies.

PEPSICO CASE

Factual Background of the case

PepsiCo Filed an application to register a new plant variety called FL 2027. They primarily labelled it to be a brand-new variety, with its first commercial sale taking place on December 17, 2009⁸⁸⁹. This application was supported by a document where the original breeder, Robert Hoopes, conveyed all rights to a company called Recot Inc., established in the USA. Later on, PepsiCo informed the Registrar that they believed FL 2027 should actually be classified as 'extant,' which means it was readily available and not entirely new. However, when they submitted their revised application, they once again referred to FL 2027 as 'new'. After reviewing it, the Registrar decided to proceed with the registration under the 'extant' category. As a result, on February 1, 2016, PepsiCo received the registration certificate for FL 2027⁸⁹⁰. Respondent filed a petition to cancel the registration as it was granted certificate by PepsiCo by erroneous information and documents therefore it was not eligible to be protected under the Patent Act⁸⁹¹.

A dissection of the analysis and conclusions drawn by Justice Yashwant Varma

The Court noted that Section 34 of the Act used the expression “may on the application in the prescribed manner of any person interested, be revoked”. The Court further noted that Section 34 of the Act was *pari materia* to Section 64 of the Patents Act, 1970. The Court relied on *Sukesh Behl v. Koninklijke Phillips Electronics*⁸⁹², wherein the Division Bench of this Court dealt with the issue of “whether the power to revoke would be warranted in situations where a failure to furnish information

⁸⁸⁷ Section 3(j) of the Patents Act, 1970, The Patents (Amendment) Act, 2005, published as law in the Gazette of India on 5 April 2005.

⁸⁸⁸ Preamble, The Protection of Plant Varieties and Farmers' Rights Act, Act No 53 of 2001 (30 October 2001).

⁸⁸⁹ *PepsiCo India Holdings (P) Ltd. v. Kavitha Kuruganti*, 2024 SCC OnLine Del 153

⁸⁹⁰ *PepsiCo India Holdings (P) Ltd. v. Kavitha Kuruganti*, 2024 SCC OnLine Del 153

⁸⁹¹ *PepsiCo India Holdings (P) Ltd. v. Kavitha Kuruganti*, 2024 SCC OnLine Del 153

⁸⁹² 2014 SCC OnLine Del 2313 ('Sukesh Behl Case')



was neither intentional nor deliberate?”⁸⁹³. The Court in Suresh Behl Case (supra) observed that “the word ‘may’ employed in Section 64(1)⁸⁹⁴ indicated that the provision was directory and raised a presumption that the power of revocation of patents conferred under Section 64(1)⁸⁹⁵ was discretionary. The word ‘may’ was not a word of compulsion⁸⁹⁶. The revocation under Section 64(1)(m)⁸⁹⁷ was not automatic and it was always open to the Court to examine whether the omission to furnish the information was deliberate or intentional. The revocation would follow only if the Court was of the view that the omission to furnish the information was deliberate”⁸⁹⁸. The Court stated that while applying for registration, PepsiCo had never claimed FL 2027 to be novel⁸⁹⁹. The Court similarly noted that in terms of the provisions made in Rule 22(2A)⁹⁰⁰. PepsiCo had the right to apply for registration under the ‘extant’ variety within 15 years from the date of first sale and the application as ultimately made would thus be within the 15-year time period, be it computed from 28-10-2002 or 17-12-2009.⁹⁰¹

The Court affirmed that the prior Single Judge’s decision that the mistake of styling the variety as ‘new’ was remediable and in any case not fatal to the cause especially since the Registrar itself had decided to process the same as relating to the ‘extant’ category⁹⁰². However, the Court did not uphold the Single Judge’s decision insofar as it affirmed the order of revocation primarily on the ground of PepsiCo having furnished incorrect information relating to the date of first commercial sale as well as failure on its part to present requisite documentation at the time of applying for registration as mandated in terms of the Act⁹⁰³. The Court thus set aside the Single Judge’s decision to this extent. The Court further held that the renewal application made by PepsiCo should stand restored on the file of the Registrar who should dispose of the same in accordance with law⁹⁰⁴.

Justice Nagarathna on Centre’s approval for Genetically Modified mustard cultivation

⁸⁹³ 2014 SCC OnLine Del 2313 (‘Suresh Behl Case’)

⁸⁹⁴ The Protection of Plant Varieties and Farmers’ Rights Act, Act No 53 of 2001 (30 October 2001).

⁸⁹⁵ The Protection of Plant Varieties and Farmers’ Rights Act, Act No 53 of 2001 (30 October 2001).

⁸⁹⁶ 2014 SCC OnLine Del 2313 (‘Suresh Behl Case’)

⁸⁹⁷ The Protection of Plant Varieties and Farmers’ Rights Act, Act No 53 of 2001 (30 October 2001).

⁸⁹⁸ PepsiCo India Holdings (P) Ltd. v. Kavitha Kuruganti, 2024 SCC OnLine Del 153

⁸⁹⁹ PepsiCo India Holdings (P) Ltd. v. Kavitha Kuruganti, 2024 SCC OnLine Del 153

⁹⁰⁰ Protection of Plant Varieties and Farmers’ Rights Rules, 2003 (‘Rules’),

⁹⁰¹ PepsiCo India Holdings (P) Ltd. v. Kavitha Kuruganti, 2024 SCC OnLine Del 153

⁹⁰² PepsiCo India Holdings (P) Ltd. v. Kavitha Kuruganti, 2024 SCC OnLine Del 153

⁹⁰³ PepsiCo India Holdings (P) Ltd. v. Kavitha Kuruganti, 2024 SCC OnLine Del 153

⁹⁰⁴ PepsiCo India Holdings (P) Ltd. v. Kavitha Kuruganti, 2024 SCC OnLine Del 153



In *Gene campaign v. Union of India*⁹⁰⁵ the division bench unanimously quashed the approval given for environmental release of Dhara Mustard Hybrid-11 (DMH-11) mustard by the GEAC and the Ministry of Environment Forests and Climate Change (MoEFCC)⁹⁰⁶. “The Union of India could not have unilaterally acted on such a serious matter without bringing to the notice of the States, particularly in the northern and north-western States where mustard is being grown. The States cannot be treated as satellites of the Union of India as they have constitutional identity and powers and responsibilities conferred under the Constitution of India and therefore, their views in the matter are of significance.”⁹⁰⁷ Justice Nagarathna referred to Supreme Court of the Netherlands decision in *State of the Netherlands (Ministry of Economic Affairs and Climate Policy) v. Stichting Urgenda*⁹⁰⁸, wherein it was observed that the State’s violation of the right to life and right to respect for private and family life necessitated judicial direction for remedial measures⁹⁰⁹. Therefore, disputes seeking review of administrative decisions impacting the environment turn on the relative weight that a decision maker accorded to competing considerations while perceiving the larger public interest⁹¹⁰. It was correspondingly held that GEAC failed to take into consideration the precautionary principles while approving the environmental release of the transgenic mustard DMH-11 hybrid⁹¹¹. Justice B.V Nagarathna and Justice Sanjay Karol, unanimously directed the Union of India to evolve a National Policy on GM crops in the realm of research, cultivation, trade and commerce in the country⁹¹². The said National Policy shall be formulated in consultation with all stakeholders, such as, experts in the field of agriculture, biotechnology, State Governments, representatives of the farmers, etc⁹¹³. The National Policy to be formulated shall be given due publicity⁹¹⁴. The MoEF&CC was directed to conduct a national consultation, preferably within the next four months, with the aim of formulating the National Policy on GM crops⁹¹⁵. The State Governments shall be involved in evolving the National Policy on GM crops⁹¹⁶. Even though this precedent doesn’t involve PPV&FRA it deals with a similar

⁹⁰⁵ 2024 SCC OnLine SC 1793

⁹⁰⁶ 2024 SCC OnLine SC 1793

⁹⁰⁷ 2024 SCC OnLine SC 1793

⁹⁰⁸ 19/00135

⁹⁰⁹ 19/00135

⁹¹⁰ 2024 SCC OnLine SC 1793

⁹¹¹ 2024 SCC OnLine SC 1793

⁹¹² 2024 SCC OnLine SC 1793

⁹¹³ 2024 SCC OnLine SC 1793

⁹¹⁴ 2024 SCC OnLine SC 1793

⁹¹⁵ 2024 SCC OnLine SC 1793

⁹¹⁶ 2024 SCC OnLine SC 1793



matter where “The failure to adequately assess health and environmental impact of Genetically Modified crops seriously infringes upon intergenerational equity as it potentially endangers the ability of future citizens to enjoy the highest attainable standard of health.”⁹¹⁷ Hence it can be seen that whether it is PPV&FRA, Indian Patents Act or any other statute for that matter overlap or contradict each other’s provisions judicial review plays a fundamental role in untangling the complexities of these legislation.

SEEDLINGS WITH WEAK ROOTS

Like we observed in previous precedents public interest always prevails over plant breeder’s or an individual’s interest but in a case a breeder-Monsanto developed Bt cotton, engineered to resist bollworm pests using a gene from *Bacillus thuringiensis*⁹¹⁸. They licensed the technology to Indian companies like Nuziveedu, but the contract got chaotic over royalty payments, especially after the government set price controls on seeds⁹¹⁹. Nuziveedu challenged the patent, arguing that it violated Indian law, which doesn’t allow patents on plants⁹²⁰. Initially, the Delhi High Court sided with Monsanto, but a later ruling overturned that decision, saying it involved a crucial biological process⁹²¹. The Supreme Court of India then stepped in, suggesting that Monsanto’s technology could be patentable and asked the High Court to determine fair royalty payments. After a lengthy legal battle, the two sides reached a settlement in 2021, bringing an end to the dispute⁹²². This case highlighted the tension between innovation and agricultural policies in India indirectly it can be interpreted by analysing the case is that Indian patent law prevails over PPV&FRA.

A legal ecotone

⁹¹⁷ Justice Nagaratna, 2024 SCC OnLine SC 1793

⁹¹⁸ Monsanto Technology LLC & Ors. vs. Nuziveedu Seeds Ltd. & Ors., CS(COMM) 132/2016. Order dated March 28, 2017.

⁹¹⁹ Monsanto Technology LLC & Ors. vs. Nuziveedu Seeds Ltd. & Ors., CS(COMM) 132/2016. Order dated March 28, 2017.

⁹²⁰ Monsanto Technology LLC & Ors. vs. Nuziveedu Seeds Ltd. & Ors., CS(COMM) 132/2016. Order dated March 28, 2017.

⁹²¹ Nuziveedu Seeds Ltd. And Ors. vs Monsanto Technology Llc And Ors

⁹²² Monsanto Technology LLC & Ors. vs. Nuziveedu Seeds Ltd. & Ors., CS(COMM) 132/2016. Order dated March 28, 2017.



After the Monsanto case⁹²³ In mid-2016, Mahyco decided to pull back its request for regulatory approval for herbicide-tolerant Bt cotton⁹²⁴. Since then, the government has been stepping up efforts to tackle the spread of illegal herbicide-tolerant cottonseed. However, farmers are left in a tough spot, as there aren't any approved alternatives to turn to. In Karnataka's Nanjangud region, the Rasabale (a specie of banana) has been grappling with a serious threat from fusarium wilt, a harmful fungal disease. At one point, the beloved banana was nearly lost, with just 10 acres left. Thankfully, the University of Agricultural Sciences in Bangalore worked to revive it by using healthy plants that weren't affected. If local farmers had been supported or incentivized to preserve the resistant varieties, we might have seen this unique banana thrive instead of facing near-extinction which is now came be seen reviving eventually⁹²⁵.

Hydrotropism towards stability

It is clear that continuous research and innovation is required in order to survive in the global market. To meet the demands of the dynamic world, new modifications are made to the products and since microbiology and biotechnology has many upcoming potentials in the near future, the relationship between biotechnology, bioinformatics, microbiology and pharmaceutical industry is also becoming cohesive to meet these expectations. The technological developments in these upcoming and progressive fields are responsible for a number of challenges to the IP assets⁹²⁶.

CONCLUSION

While there are areas where the PPV&FRA and the Indian Patents Act seem to overlap, there are still complement each other in some areas. The Patents Act encourages innovation in biotechnology, while the PPV&FR Act protects farmers and their traditional rights. When applied thoughtfully, these laws can complement each other rather than conflicting. Cases like Monsanto and PepsiCo have helped shape how we can overcome these overlaps, offering valuable guidance for future disputes. Still, the PPV&FR Act has some gaps that have been taken advantage of, especially by large breeders and

⁹²³ Monsanto Technology LLC & Ors. vs. Nuziveedu Seeds Ltd. & Ors., CS(COMM) 132/2016. Order dated March 28, 2017.

⁹²⁴ Department Of Agriculture v. M/S Mahyco Monsanto Biotech (India)

⁹²⁵ Nanjangud Rasabale: Revival of Nanjangud Rasabale Cultivation | Mysuru News - Times of India

⁹²⁶ Deepa Goel, Shomini Parashar, Intellectual property rights, biosafety, and bioethics, 126-127 (Always learning, 1st edition) (2013)



corporations. This dissolves the whole point of protections it was meant to offer. At the same time, many farmers remain wary of new technologies, often because of past experiences, lack of information, or fear of being exploited. This mistrust makes it harder for positive innovations to reach the ground where they're needed most. Furthermore, it's crucial to build a legal and policy framework that not only encourages innovation but also earns the trust of the farmers who rely on traditional methods. Strengthening errors, overcoming legal loopholes, and engaging directly with farmers are key steps toward that balance.

