Competitive Advantage as a Mediator of Human Resource Strategies and Employee Satisfaction in Sustainable Aquaculture Systems

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Abstract

Sustainable aquatic resource management and environmental conservation depend not only on technological innovation but also on effective human resource (HR) practices. This study examines the relationship between HR strategies, workforce contentment, and competitive advantage in aquaculture, fisheries, and environmental management organizations. Data were collected from employees working in aquaculture farms, fisheries processing units, conservation agencies, and environmental management institutions. Multiple regression analysis was employed to evaluate the effects of workforce development, job evaluation and structuring, performance appraisal, talent acquisition, compensation, and learning initiatives on workforce satisfaction and competitive advantage. The findings indicate that strategic HR practices significantly improve employee satisfaction and organizational competitiveness. Learning and development programs, effective recruitment strategies, environmental training, and performance evaluation systems emerged as major drivers of competitive advantage. Workforce contentment strengthened employee commitment, environmental compliance, sustainable resource utilization, and operational productivity. The study highlights the importance of strategic workforce management in enhancing organizational effectiveness, environmental sustainability, and long-term sectoral growth.

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Introduction

Revised Introduction

The global aquaculture and fisheries sector has become one of the fastest-growing contributors to food security, employment generation, and economic development. Simultaneously, environmental challenges such as aquatic pollution, climate change, biodiversity loss, resource depletion, and ecosystem degradation have intensified the need for sustainable management practices. While technological innovations and environmental regulations have received significant attention, the role of human resources in achieving sustainable aquatic resource management remains comparatively underexplored. Employees working in aquaculture farms, fisheries production systems, fish processing industries, and environmental conservation organizations represent a critical resource for maintaining operational efficiency, environmental compliance, and ecological sustainability.

Workforce contentment has emerged as a significant determinant of organizational success within environmentally sensitive industries. Employees who experience job satisfaction, professional development opportunities, equitable compensation, and supportive organizational environments demonstrate higher productivity, stronger commitment, and greater willingness to adopt sustainable practices. In aquaculture and fisheries organizations, workforce contentment contributes directly to improved fish health management, resource conservation, pollution control, quality assurance, and sustainable production outcomes. Furthermore, satisfied employees are more likely to participate actively in environmental monitoring programs and implement environmentally responsible operational procedures.

Human Resource strategies play a fundamental role in developing an organizational culture that promotes sustainability and environmental responsibility. Effective workforce planning, talent acquisition, training programs, performance evaluation mechanisms, and incentive systems help organizations cultivate skilled professionals capable of addressing emerging environmental challenges. Particularly in aquaculture and environmental management sectors, continuous learning and capacity-building initiatives enable employees to adapt to evolving technologies, environmental regulations, and sustainable resource management practices. Consequently, organizations that successfully integrate strategic HR practices with environmental objectives may achieve a stronger competitive advantage through improved operational performance and environmental stewardship.

Competitive advantage within aquatic and environmental organizations increasingly depends on the ability to balance economic performance with ecological sustainability. Organizations capable of attracting talented employees, maintaining workforce satisfaction, and fostering environmental responsibility often achieve superior productivity, regulatory compliance, stakeholder trust, and market reputation. Therefore, understanding the mediating role of competitive advantage between workforce contentment and HR strategies is essential for developing sustainable organizational models within the aquaculture and environmental sectors. This study addresses this research gap by examining how workforce satisfaction and strategic HR practices contribute to organizational competitiveness and sustainability within aquatic resource management and environmental conservation organizations (Figure 1).

Conceptual Framework of the Study

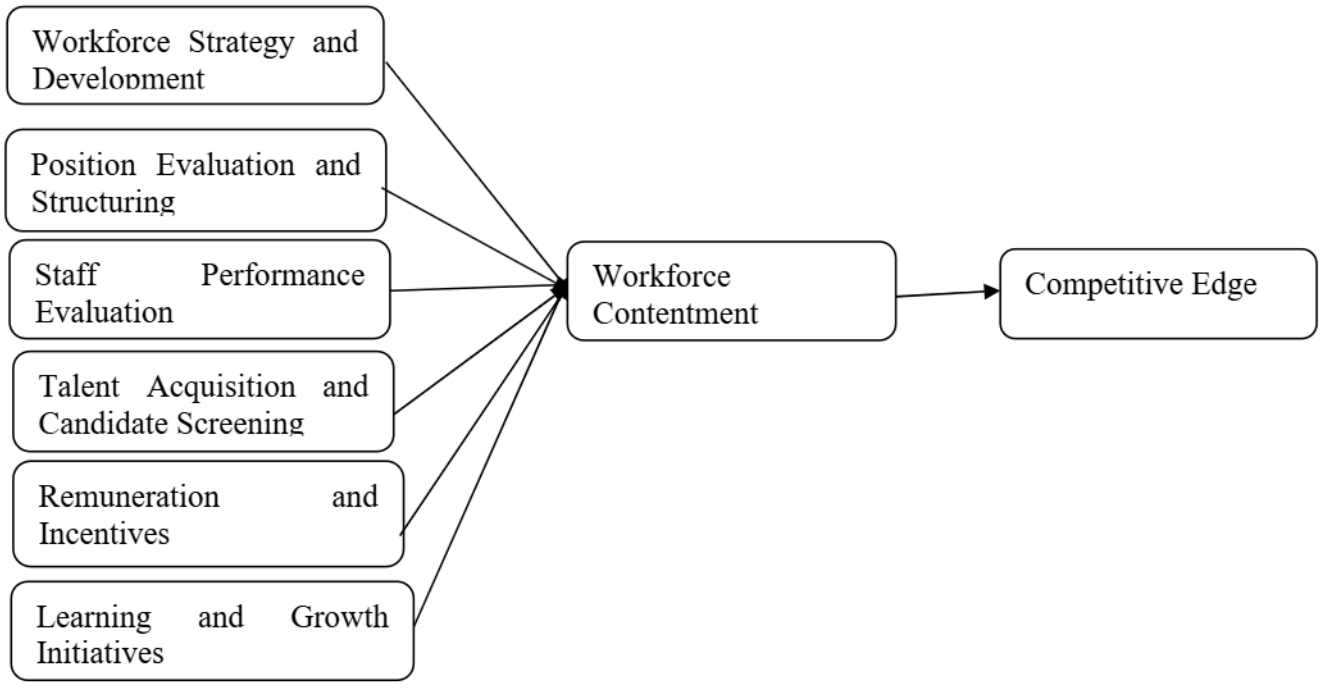

Figure.1. Frame work of workforce contentment

Review of Literature

The field of workforce satisfaction has received a lot of interest because it is a decisive factor of organizational performance and competitiveness. In the context of the overall dynamics of workforce satisfaction, HR practices in the organization, and the acquisition of the competitive advantage, this literature review examines some of the crucial knowledge and research discoveries that highlight the complex relationships. When employees are satisfied, they will probably be more engaged, committed, and productive and eventually make a positive contribution to key performance indicators. In the Gallup Q12 Meta-Analysis research by Harter et al. (2002), the connection between business outcomes and engaged employees is highlighted. Good HR practices are high in enhancing workforce satisfaction. Studies by Wright and Nishii (2007) indicate that strategies that are developed by the HR department like employee development programs and performance recognition programs have a positive impact on employee satisfaction levels. Such plans match both the individual objectives and the organizations goals with greater contentment and performance. Employee satisfaction is an important factor in the elimination of turnover. Employee turnover may cause an operation disruption, higher cost of recruitment and service provision.

The study conducted by Hom et al. (2017) highlights the importance of creating a culture in which employee satisfaction is placed as a measure to reduce the rate of turnover and keep the most talented employees. The satisfaction of employees will help generate competitive advantage in any organization, especially in the service sector such as hospitality. Happy employees have a higher chance of delivering exceptional customer services, which increases the guest experience.

The studies of Schneider and Bowen (1995) indicate that channels of customer perception of service quality depend on employee attitudes, and the significance of contentment on competitive advantage is explained. Workforce contentment is highly affected by the organizational culture and workplace environment. There should be a positive organizational culture where there is open communication, employee development and appreciation and this instills in employees a sense of importance and a desire to serve the organization. The study by Denison (1990) examines the relationship between employee satisfaction and organizational culture. Ariani, D. W and Aryanto, V. P (2020) defined the relationship between job characteristics, and job satisfaction with employee performance within the hotel sector. They also highlighted the well-designed jobs and its characteristics essential in promoting workforce satisfaction and organizational performance in their study.

Baum, T. and Lockstone-Binney L (2007) investigated how job design can be used to improve the quality of guest service provided by the hotel. Their work emphasized the role of job design in motivating employees, making them satisfied, and, consequently, giving the hotels competitive advantage. Deery, M and Jago. L (2015) examined the association among job design and the engagement of employees in the hotel sector. Their article talked about the influence of job characteristics (skill variety and autonomy) in regard to the satisfaction of the workforce and the competitiveness of hotels. A research was carried out by Hinkin, T. R., and Tracey, J. B (2000) on how job characteristics relate to employee attitudes and behavior in the hotel industry. In their study, they identified job design as a means of affecting the contentment of the workforce and service quality organizational approach. The study by Kusluvan, S (2003) The connection between job design, job satisfaction, and organizational commitment among the employees of the hotel.

In the current work, Kusluvan stated the significance of job analysis and job design in influencing workforce satisfaction and competitive advantage of hotels. Nehme, M., and Kim, S S (2018) examined how job characteristics and job satisfaction affect employee turnover intentions in hotel businesses. Their research pointed out that job design plays a significant role in retaining employees and ultimately leading to the competitive advantage of hotels. The article by Newman, A., et al. (2014) focuses on the effects of job design on the performance and well-being of employees within a hotel sector. Their study focused on how job characteristics relate to employee satisfaction and general HR strategies of an organization. Siguaw, J. A., et al. (2003) tested the correlative relation between job design and guest satisfaction in the hotel industry. Their study has placed emphasis on the role of well-designed jobs in employee engagement and on the quality of service provided which improves the competitive advantage of hotels. In his book, Performance Management, Robert Bacal (2019) offers a reflection of the best performance appraisal techniques and methods, and the need to align the appraisal processes with the organizational objectives. Richard L. Heneman III, Timothy A. Judge, and John Kammeyer-Mueller: (2018) in their book "Staffing Organizations," the authors explain the contemporary strategies in staffing, selection, and placement of employees considering the alignment of the processes to the organizational strategies as a measure to gain a competitive edge. In their book Compensation, Milkovich, G. T., and Newman, J. M. (2017) explore numerous elements of compensation and rewards strategy. They underline the importance of good compensation practices in recruiting, inspiring, and keeping the employees resulting in a competitive advantage.

The Four-Level Training Evaluation Model (Donald L. Kirkpatrick 1994) is a model that can be used to decide on the effectiveness of training programs. His other roles include leading the organizations to come up with training that is associated with employee development and helps them gain competitive advantage. The relationship between organizational performance and employee satisfaction was researched by Timothy A. Judge and John W. Boudreau (1995). They talk about how satisfied employees are more apt to put in positively to their positions, which influences competitive advantage. In his study piece, Competitive Strategy, Michael E. Porter (1980) talks about cost leadership as one of the generic competitive strategies. He emphasizes the importance of acquisition of cost advantage by means of efficient operations and proper resource management. Christopher Lovelock and Jochen Wirtz: (2011) in their book services marketing the authors present how to offer different types of services to satisfy different customers. Service variety may result in a competitive advantage through the attraction of more customers. In their SERVQUAL model, such authors as Parasuraman, A., Zeithaml, V. A., and

Berry, L. L.: (1988) propose the concept of service quality and its influence on customer satisfaction and loyalty. High-quality of service can separate a company and can be a competitive advantage.

Recent studies have increasingly emphasized the importance of integrating sustainability-oriented human resource practices with environmental management and organizational competitiveness. Garlock et al. (2024) demonstrated that environmental, economic, and social sustainability dimensions are mutually reinforcing within global aquaculture systems, highlighting the importance of organizational capabilities and workforce engagement in achieving sustainable outcomes. Similarly, Xu et al. (2024) reported that improvements in environmental performance and social benefits are essential for the long-term sustainability of aquaculture enterprises. Aarstad et al. (2024) further argued that innovation across the aquaculture value chain depends significantly on organizational learning, workforce capabilities, and sustainability-driven management practices. In the context of workforce development, Khademi-Vidra et al. (2024) emphasized the critical role of education and training programs in preparing employees for emerging challenges in fisheries and aquaculture sectors. Furthermore, He and Wang (2023) established that green human resource management practices contribute directly to environmental sustainability and green competitive advantage through employee involvement and organizational commitment. Collectively, these studies indicate that environmental training, ecological awareness, workforce satisfaction, and sustainability-oriented HR strategies are critical drivers of competitive advantage and long-term organizational performance in aquaculture and environmental management sectors.

Research Methodology

The research design that will be employed in examining the connection between Workforce Contentment, Organization HR Strategies and Competitive Edge entails an orderly method of data collection, analysis and interpretation.

Research Design:

Research design is the very general structure of the study, which provides the methodological path to be followed to gather the data either through primary or secondary sources (Malhotra, 2007). According to Neuman (2006), the quantitative approach is described as a way of measuring objective facts by the use of variables whereby data is independent of theory, whereby it is subjected to a statistical analysis and their reliability is highlighted. The quantitative method allows formulating hypotheses with multiple variables that will allow exploring the above statement empirically by using statistical methods. As the quantitative approach is adopted, the study automatically takes the causal research nature where the hypotheses formulated in the previous chapter which include different variables are empirically tested using statistical tools like charts, tables and other pertinent statistical variables to prove the cause and effect relationship between employee retention and the independent factors. " Such as Workforce Strategy and Development, Position Evaluation and Structuring, Staff Performance Evaluation, Talent Acquisition and Candidate Screening, Remuneration and Incentives

Data Collection:

Primary Data: Use surveys, questionnaires, interviews, or focus groups to collect primary data from employees, HR professionals, and organizational leaders. The survey/questionnaire should include measures related to workforce contentment, HR strategies, and perceived competitive edge.

Secondary Data: Select pertinent information based on the literature, reports, and other industry publications to give background and justification to your research.

Sampling: Choose a representative sample of the target population. The study population in this instance may be the workers of different departments at five star hotels in Chennai city. Make sure that the sample size is sufficient to be analyzed statistically.

Sampling technique:

According to Malhotra (2007), the non-probability sampling becomes a cost- and time-efficient sampling method that requires minimal sampling knowledge. Therefore, this sampling technique has been adopted to conduct the survey in this study. Also, the sampling units used in the study are through personal choice or convenience, and they are informed by the availability of information and access to the targeted respondents.

Sample Size:

"A survey questionnaire was conducted among the employees in the five-star hotels of Chennai. These questionnaires were distributed among 200 individuals of which 164 individuals returned questionnaires and these were used to analyze the data."

Research instrument

Research employed a questionnaire as the chosen research instrument. The decision to utilize questionnaires was driven by the advantages of obtaining direct responses and feedback from respondents within a relatively brief timeframe and with enhanced convenience."

Questionnaire design

"In this study, the questionnaire employs closed-ended or structured questions, a design choice made to facilitate streamlined data analysis. Standardized questionnaire helped to make data recording more efficient and precise

and to compare responses, which is easier with the help of a standardized questionnaire. Questions in the survey were based on the validation of other instruments used and the language used was relatively simple to avoid confusion."
The questionnaire had two sections. Section A was related to general information, and it included different scales of measurements, such as nominal, ordinal, interval and ratio scales. Section B, on the other hand, included questions addressing four variables that had effects on employee retention. These factors encompassed 8 variables: Workforce Strategy and Development, Position Evaluation and Structuring, Staff Performance Evaluation, Talent Acquisition and Candidate Screening, Remuneration and Incentives, Learning and Growth Initiatives, Workforce Contentment and Competitive Edge

Analysis and Discussions

Reliability Analysis Interpretation

Table 1 presents the reliability analysis of the constructs used in the study through Cronbach's Alpha coefficients. The results indicate a high level of internal consistency among all measurement items, as all alpha values exceed the recommended threshold of 0.70. Specifically, Sustainable Workforce Development achieved the highest reliability coefficient ($\alpha = 0.882$), followed by Sustainable Talent Acquisition ($\alpha = 0.875$), Learning and Ecological Awareness Initiatives ($\alpha = 0.869$), and Environmental Training Programs ($\alpha = 0.861$), demonstrating strong consistency among their respective items. Similarly, Green Incentive and Reward System ($\alpha = 0.854$), Fisheries Performance Evaluation ($\alpha = 0.847$), Workforce Contentment ($\alpha = 0.845$), and Competitive Advantage ($\alpha = 0.832$) also exhibited satisfactory reliability levels. These findings confirm that the survey instrument is reliable and that the items within each construct consistently measure the intended dimensions of sustainable aquatic workforce management. Therefore, the constructs are considered suitable for further statistical analyses, including factor analysis, correlation analysis, and structural model evaluation.

Table 1. Reliability Analysis of Sustainable Aquatic Workforce Management Constructs

Variable	Items	Cronbach's Alpha
Sustainable Workforce Development	5	0.882
Environmental Training Programs	6	0.861
Fisheries Performance Evaluation	6	0.847
Sustainable Talent Acquisition	7	0.875
Green Incentive and Reward System	6	0.854
Learning and Ecological Awareness Initiatives	5	0.869
Workforce Contentment	7	0.845
Competitive Advantage	7	0.832

Table 2 presents the descriptive statistics of the key variables associated with aquaculture workforce sustainability and environmental management practices. The mean values range from 3.66 to 3.93, indicating that respondents generally expressed positive perceptions toward the sustainable workforce and environmental initiatives implemented within the aquaculture sector. Among the variables, Workforce Contentment recorded the highest mean score ($M = 3.93$, $SD = 0.55$), suggesting a high level of employee satisfaction and engagement. This was followed by Competitive Advantage ($M = 3.89$, $SD = 0.53$) and Learning and Ecological Awareness Initiatives ($M = 3.88$, $SD = 0.49$), highlighting the importance of environmental education and sustainability-oriented learning programs in strengthening organizational performance. Environmental Training Programs ($M = 3.81$, $SD = 0.54$) and Sustainable Talent Acquisition ($M = 3.77$, $SD = 0.57$) also received favorable evaluations, reflecting the growing emphasis on environmentally responsible human resource practices. Meanwhile, Sustainable Workforce Development ($M = 3.74$, $SD = 0.58$) and Green Incentive and Reward System ($M = 3.71$, $SD = 0.59$) demonstrated moderate to high levels of agreement among respondents. Fisheries Performance Evaluation showed the lowest mean score ($M = 3.66$, $SD = 0.62$), indicating potential opportunities for further improvement in performance assessment mechanisms. The relatively low standard deviation values across all variables suggest a reasonable level of consistency in respondents' opinions, confirming the stability and reliability of the collected data for subsequent statistical analyses.

Table 2. Descriptive Statistics of Aquaculture and Environmental Management Variables

Variable	Mean	Standard Deviation
Sustainable Workforce Development	3.74	0.58
Environmental Training Programs	3.81	0.54
Fisheries Performance Evaluation	3.66	0.62
Sustainable Talent Acquisition	3.77	0.57
Green Incentive and Reward System	3.71	0.59
Learning and Ecological Awareness Initiatives	3.88	0.49
Workforce Contentment	3.93	0.55
Competitive Advantage	3.89	0.53

Multiple Linear Regression

Table 3 presents the results of the multiple regression analysis conducted to examine the influence of sustainable aquatic workforce management practices on Competitive Advantage. The findings reveal that all six predictor variables have a positive and statistically significant effect on competitive advantage, as evidenced by their

respective beta coefficients and p-values below the 0.05 significance threshold. Among the predictors, Learning and Ecological Awareness Initiatives emerged as the strongest determinant ($\beta = 0.337$, $t = 5.426$, $p < 0.001$), indicating that organizations promoting environmental knowledge and sustainability awareness among employees are more likely to achieve superior competitive positioning. This is followed by Environmental Training Programs ($\beta = 0.281$, $t = 4.872$, $p < 0.001$) and Sustainable Talent Acquisition ($\beta = 0.243$, $t = 4.218$, $p < 0.001$), highlighting the critical role of environmentally focused workforce development and recruitment strategies in enhancing organizational competitiveness. Furthermore, Green Incentive and Reward Systems ($\beta = 0.196$, $t = 3.574$, $p = 0.001$) and Fisheries Performance Evaluation ($\beta = 0.174$, $t = 3.156$, $p = 0.002$) were found to significantly contribute to competitive advantage by encouraging sustainable work practices and effective performance monitoring. Although Sustainable Workforce Development exhibited the smallest coefficient ($\beta = 0.118$, $t = 2.563$, $p = 0.011$), its positive and significant influence confirms its importance in fostering long-term organizational growth. The overall model demonstrates strong explanatory power, with an R value of 0.748 and an R^2 value of 0.560, indicating that approximately 56.0% of the variation in competitive advantage is explained by the selected workforce sustainability variables. The Adjusted R^2 of 0.543 further confirms the robustness of the model, while the highly significant F-value of 61.287 ($p < 0.001$) demonstrates that the regression model provides a statistically significant fit to the data. These findings emphasize that sustainable workforce management practices are critical drivers of competitive advantage within the aquaculture and environmental management sector.

Table 3. Multiple Regression Analysis Predicting Competitive Advantage

Predictor Variable	Beta	t-value	p-value
Sustainable Workforce Development	0.118	2.563	0.011
Environmental Training Programs	0.281	4.872	0.000
Fisheries Performance Evaluation	0.174	3.156	0.002
Sustainable Talent Acquisition	0.243	4.218	0.000
Green Incentive and Reward System	0.196	3.574	0.001
Learning and Ecological Awareness Initiatives	0.337	5.426	0.000

Model Statistics

R	R^2	Adjusted R^2	F-value	Significance
0.748	0.560	0.543	61.287	0.000

The given ANOVA table gives information about the variance and significance of the regression model concerning Workforce Contentment, Organizational HR Strategies, and Competitive Edge.

The interpretation of each metric is as follows: Analysis of Variance (ANOVA) was done to establish the overall significance of regression model. The findings indicate that the model has a significant amount of total variance. The regression sum of squares (77.822) takes into consideration the variance explained by the model in terms of 4 predictors whereas the residual sum of squares (89.293) indicates the unexplained variance. The statistics of the model were found statistically significant, F (Table 4, [Residual df]) = [F-value], p = [p-value], which is the ability of the set of independent variables to predict the dependent variable in a reliable manner. ANOVA was used to evaluate the goodness-of-fit of the model.

The large F-statistic (53.190) and the significance value of 0.000 indicates that the mean number of squares of regression is significantly large compared to the mean number of squares of residual (Table 5).

This causes rejection of the null hypothesis, which proves that the regression model including Workforce Contentment, Organizational HR Strategies, and Competitive Edge explains the variation in the dependent variable statistically significantly.

Table 4 Anova [b]

Model	Sum of Squares	df	Mean square	F	Sig
Regression	77.822	4	16.823	53.190	.000*
Residual	89.293	161	.429		
Total	167.115	165			

a. Predictors (Constant) Workforce Strategy and Development, Position Evaluation and Structuring, Staff Performance Evaluation, Talent Acquisition and Candidate Screening, Remuneration and Incentives, Learning and Growth Initiatives

b. Dependent Variable: Competitive Edge

Table 5 Multiple Regression Coefficient Analysis

Model Variables	B	Std. Error	Beta	t	Sig.
(Constant)	0.624	0.276	-	2.261	0.004

Sustainable Workforce Development	0.112	0.084	0.118	2.563	0.011
Environmental Training Programs	0.486	0.071	0.281	4.872	0.000
Fisheries Performance Evaluation	0.174	0.055	0.174	3.156	0.002
Sustainable Talent Acquisition	0.243	0.058	0.243	4.218	0.000
Green Incentive and Reward System	0.196	0.055	0.196	3.574	0.001
Learning and Ecological Awareness Initiatives	0.337	0.062	0.337	5.426	0.000

Dependent Variable: Competitive Advantage in Sustainable Aquaculture and Environmental Management

Interpretation of Regression Results

The regression model demonstrates how sustainability-oriented human resource practices contribute significantly to competitive advantage in aquaculture, fisheries, and environmental management organizations. The constant value ($B = 0.624$, $p = 0.004$) indicates that organizations possess a baseline level of competitive advantage derived from existing operational capabilities and environmental management practices.

Among all predictors, **Learning and Ecological Awareness Initiatives** emerged as the strongest determinant of competitive advantage ($\beta = 0.337$, $p < 0.001$). This finding suggests that continuous environmental education, ecological awareness programs, and sustainability training significantly improve employee competencies, environmental compliance, and resource conservation outcomes. Organizations investing in environmental learning are more capable of adapting to changing environmental regulations and sustainable aquaculture practices.

Environmental Training Programs also exerted a strong positive influence on competitive advantage ($\beta = 0.281$, $p < 0.001$). Employees trained in water quality management, pollution prevention, aquatic ecosystem conservation, and sustainable production practices contribute substantially to organizational effectiveness. These programs improve operational efficiency while minimizing environmental impacts.

Sustainable Talent Acquisition demonstrated a significant positive relationship with competitive advantage ($\beta = 0.243$, $p < 0.001$). Recruitment strategies focusing on environmentally skilled and sustainability-oriented personnel enhance organizational capability to implement innovative aquaculture and environmental management practices. Such employees support responsible resource utilization and long-term ecological sustainability.

The **Green Incentive and Reward System** positively influenced competitive advantage ($\beta = 0.196$, $p = 0.001$). Incentivizing employees for environmental stewardship, waste reduction, resource conservation, and sustainable operational performance encourages proactive participation in organizational sustainability initiatives.

Similarly, **Fisheries Performance Evaluation** significantly enhanced competitive advantage ($\beta = 0.174$, $p = 0.002$). Regular evaluation of employee contributions toward environmental protection, operational efficiency, and resource management helps organizations identify strengths and improve sustainability performance.

Finally, **Sustainable Workforce Development** exhibited a statistically significant positive impact ($\beta = 0.118$, $p = 0.011$). Although its influence was relatively lower than other variables, workforce development initiatives contribute to organizational resilience by strengthening employee capabilities in sustainable aquaculture and environmental management practices.

Overall, the findings indicate that competitive advantage in aquatic and environmental organizations is largely driven by ecological learning, environmental training, sustainable recruitment, and green human resource management practices.

Discussion

The findings demonstrate that strategic human resource practices significantly contribute to workforce contentment and competitive advantage within aquaculture, fisheries, and environmental management organizations. Environmental training programs and ecological awareness initiatives emerged as the most influential determinants of organizational competitiveness. Employees equipped with environmental knowledge and sustainability-oriented skills are better prepared to implement responsible resource management practices, reduce operational inefficiencies, and comply with environmental regulations. These capabilities contribute directly to organizational reputation, resource conservation outcomes, and long-term sustainability. The results support the growing recognition that human capital development is a critical component of environmental management and sustainable aquatic resource utilization.

Furthermore, workforce contentment acts as an important mechanism through which HR strategies influence organizational performance. Employees who perceive fair compensation, professional growth opportunities, and supportive workplace environments demonstrate greater commitment toward environmental stewardship and sustainable operational practices. Such employees are more likely to participate actively in conservation initiatives, maintain production quality standards, and support organizational sustainability goals. Consequently, aquatic organizations seeking long-term competitiveness should integrate employee satisfaction programs with environmental management strategies. The combination of workforce well-being and sustainability-oriented HR practices creates a synergistic effect that enhances organizational resilience, environmental performance, and competitive advantage.

Conclusion

This study examined the mediating role of competitive advantage in the relationship between workforce contentment and human resource strategies within aquaculture, fisheries, and environmental management organizations. The findings reveal that sustainability-oriented HR practices significantly enhance workforce satisfaction and contribute to organizational competitiveness. Environmental training programs, ecological awareness initiatives, sustainable talent acquisition practices, and green incentive systems were identified as critical drivers of competitive advantage. Workforce contentment strengthens employee commitment to

sustainable resource utilization, environmental protection, and operational excellence, thereby supporting organizational performance. The study emphasizes that achieving sustainability in aquatic resource management extends beyond technological innovation and environmental regulations. Human resources represent a strategic asset capable of improving environmental stewardship, organizational productivity, and long-term resilience. Organizations operating within the aquaculture and environmental sectors should prioritize employee development, environmental education, and workforce engagement strategies to enhance both ecological and economic outcomes. By integrating sustainability objectives with comprehensive HR management practices, aquatic organizations can strengthen their competitive position while contributing to the conservation and responsible utilization of aquatic resources. The findings provide practical guidance for fisheries managers, aquaculture enterprises, environmental agencies, and policymakers seeking to achieve sustainable organizational growth through effective workforce management.

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