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Economics of Sustainbility – A Theoritical Perspective

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ABSTRACT

Success of the human life relies on the sustainability of people's standard of living. Defining the term sustainability is a difficult task as it is complex in nature. This study is an attempt to project, new hypotheses to the term sustainability, by using natural and warranted growth rates. The unique concept of this research is to introduce a new concept called 'SNS Measurement' for Sustainability. This study also throws light on the link between the present and future generation in terms of sustainability in natural resources. Production is meaningful only when consumption is made and consumption without production leads to scarcity. Therefore the present theory initiates the concept of sustainability which involves in three aspects, firstly, the problems of distribution equity between inter and intra generations, secondly linkage of productions and production efficiency and finally, replacement of natural and artificial resources.

Keywords: Sustainability, Natural resources, SNS Measurement, Environment, Future.

INTRODUCTION

The concept of sustainability of sustainable growth is very complex, subjective and an abstract. Common men do not know what it may mean and what its implications might be. UNESCO document states that every generation should leave water, air and soil and other natural resources as pure and unpolluted to the future generation. It precisely states that each generation should leaveun- diminished flora and fauna to the younger generation. Does it mean that present generation should not construct buildings, road and dams? Is it our moral obligation to preserve our flora and fauna to the future? It is our sacrifice to the future generation. Is it compulsory to share the environment with the future? In fact it is an obligation to conduct ourselves in such a way to leave the undamaged environment to the future. It implies that we should not satisfy ourselves by impoverishing our successor. But we do not know the present optimum consumption that preserves an unpolluted environment to the future. Another point which relevant to this is that, we do not know the type of technology and consumption pattern and requirement of the future generation. No idea about the taste and preference of future generation. One thing, however, we must realize that we should not live at the expense of future well-being. Sustainability is a problem because each of us knows that we profit at the expense of the future[2]. In fact, we have free ride on each other and we have free ride on the future. Environment is the base for our survival but it should not become the matter of survival for the future. It is like a legacy, one should preserve the future.

ISSUES IN SUSTAINBILITY

Sustainability is a matter of distributional equity between the present and the future. It is about sharing of well-being between present generation and future generation. It is a matter of promoting our welfare without affecting the well-being of the future generation. Sustainable development is a point at which the needs of the present generation are fulfilled without compromising the ability of future generation to meet their own needs[6]. Achievement of sustainability is equity between both within the generation and across the generation, i.e. intergenerational equity and intra generational equity. It is the optimum utilization of natural resources in the present and future. It is a matter of equity rather than efficiency according to Howarth and Norgaard.[3]

People, by and large, put more emphasis on equity between generation, rather than equity across a given generation, it does not mean that latter is not important. The World Commission on the Environment and Development (The Brundtland report) in 1987 stated that both intergenerational equity and intra generational

equity are important. Those who talk and raise the issue of sharing river and ground water, forget the share, they must leave to the future generation. Now, the intergeneration environmental disputes are in the limelight. However sustainability demands more attention on the equitable shares between the generations.

When we use up some resources which are replaceable whether it is mineral, animal or any other environmental amenity, then we should provide replacement for equal value. The substitute that we provide in exchange could be knowledge, could be green technology etc. If there is no replacement there will be environmental degradation. Therefore the environment needs public policy, because each of us knows the repercussion of environmental degradation and it is burning issue today.

The solutions require for the estimation of natural and manmade capital requirement for both present future generation. It is in postponement of current consumption to the future generation. The issue of sustainability may be more appropriate to the developed countries. Because they have reached the stage of high mass consumption and further exploitation is not necessary. Whereas in the case of developing countries, the basic needs are yet to be fulfilled. Therefore the present generation in the UDC can go further and employ the resource to overcome poverty and vast income inequality without damaging the environment. The paradox arises because if we concern about people who are currently poor, that will translate into an increase in current consumption not into an increase in investment. Therefore thinking about poor people today will be disadvantageous from the point of view sustainability.

It is a serious problem even in UDCs if the technology of the production process is not nature friendly. Here comes the importance of efficiency of production function and nature and pattern of consumption. However, natural capital can be exploited by man, but cannot be created by man. According to thermodynamic school, natural capital and manmade capital are in most of the cases complements rather than substitutes[1]. They stated further that natural capital such as land, animals, aquatics, non-renewable and renewable energy and mineral stock are primary inputs and manmade capital and labourers are the agents of transformation. Sustainability intended are very high within the group and it is very low between the groups. Sustainability as a matter of distributional equity between the present and the future; it becomes the issue of saving and investment. It is the choice between current consumption and future consumption. Then one has to find out the technology which reduces the wastage in the production process. Hence, the concept of sustainability involves the problems of distribution equity between inter and intra generations and productions and production efficiency and replacement of natural and artificial resources.

MEASURES OF SUSTAINBILITY

According to Hartwick-Solow, so long as the stock of capital did not decline overtime, non-declining consumption was possible. The stock of capital could be held constant by reinvesting from all non-renewable resources. Extraction in man-made capital, is built up for replacement. Man and natural capital are assumed to be perfect substitute under their model.

PEARCE-ATKINSON MEASURE OF SUSTAINABILITY

They have proposed an indicator of weak sustainability criterion viz., PAM. To them,

$$PAM = a - C_m/Y - C_n/Y$$

Where

a is Marginal Propensity to Save, C_m = Manmade capital and C_n = natural capital

The economy is sustainable if PAM > 0. The equation states that PAM will be positive if MPS exceeds the sum of depreciation on manmade and natural capital. According to David pearce[1] and Giles D Atkinson(1993), sustaibability estimation to countries like Czechoslovakia, Germany, Hungary, Japan, Netherland, Poland and the USA passed the weak test (PAM>0). Mexico and the Philippines are classed as "Marginal" (PAM=0) while Ethipia, Indonesia, Madagascar, Malawi and Nigeria are unsustainable (PAM<0). Recently, Atkinson and Proops (1998) adopted the PAM measures to include imports and exports.

'SNS MEASUREMENT' OF SUSTAINABILITY

God has erected the universe and the environment. Natural capital such as land, water, atmosphere and minerals are gifts of nature. God has created nature along with the man kind. Man has to produce, the basic needs for his comfort. God has created land but man has to employ land to produce food grain cloth and

shelter. In the process of exploration and employment of natural resources, man has to be careful to leave the undamaged environment to the future generation. Optimum utilization of natural resources may leave due share to the future. Full employment equilibrium income of the economy indicates optimum utilization of natural resources. We cannot suffer today without employing the available resources for the sake of future generation. We cannot starve today for the sake of tomorrow's prosperity.

At the same time we cannot use the environmental resources by damaging it or going beyond her capacity. No one can go beyond the nature or conquer the nature. When we reach the peak there comes the down fall. That is life cycle and it is unavoidable law of life. Any economy is subjected to fluctuation. Therefore equality between demand and supply, saving and investment would indicated the economics of sustainability.

The economics of sustainability exist when $G=G_n=G_w$. That is the Actual growth rate = natural growth rate = Warranted growth rate. At this point the present societies fulfil its needs and reach the optimum point. Beyond this point there would not be sustainability. The points of equality between S and I is the optimum but unstable. That is S=I, the starting point of un- sustainability. Therefore investment must be less that saving. Sustainability is very high if S=K. If it becomes S=k or S=I, it is the point of sustainability. This can be explained with the following equation. For sustainability according to

PAM = $S/Y - Km/Y - Kn/Y > 0 - 1$.

Let $Km/Y + Kn/Y = K/Y$ and rewrite equation 1

As $S/Y - K/Y > 0$ -2 (or)

$S/Y > K/Y$ -3

$S > K$ -4

Equation 4 indicates high level of sustainability. If S=K then it is fairly sustainable. If we give incremental value to equation one, Then it can be rewritten as follows.

$\Delta S/\Delta Y - \Delta K/\Delta Y > 0$ 5 - or

$\Delta S/\Delta Y > \Delta K/\Delta Y$ 6 - or

$\Delta S > \Delta K$ 7 - or

For high level of sustainability, the growth rate of saving must be be greater than the growth rate of capital. But the equality between the growth rate of income and growth rate of capital can explain both economy's equilibrium and sustainability.

Let $S/Y + C/Y = 1$ that is APS + APC = 1

Let $Kn/Y + Km/Y = 1$ that is share of both natural and manmade capital in the total national income. Let $S/Y + C/Y = Kn/Y + Km/Y$ $[Kn/Y+Km/Y=K/Y]^n$ That is S+C = K

By giving incremental value the above equation can be written as follows.

$\Delta S + \Delta C$

At equilibrium point,

$\Delta Y = \Delta S + \Delta C$. Since $\Delta K = \Delta S + \Delta C = \Delta Y$, hence $\Delta K = \Delta Y$ or $I = \Delta Y$

Therefore, for sustainability the growth rate of capital must be equal to the growth rate of income which satisfy the economic equilibrium too. What the researcher concludes is that the economic equilibrium itself indicates the sustainability of the economy. This also can be explained graphically.

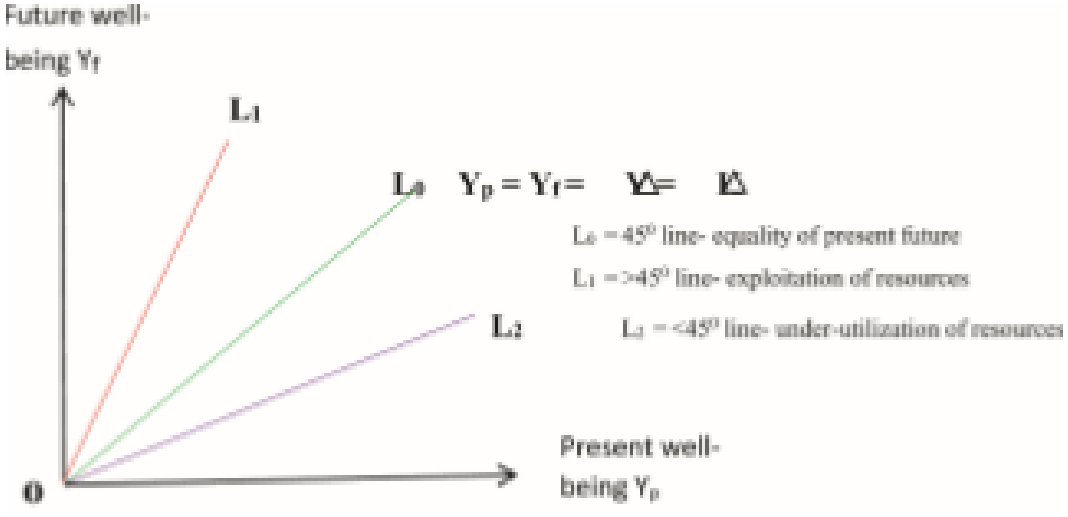

Figure 1. SNS Measurement

In figure 1, the present well-being is presented in the X axis and future well-being in the Y axis. OL straight line explains the equality between present and future generation. OL straight line (or) production function OL satisfies the sustainability norms. On the other hand, OL_1 production function indicates over exploitation of natural resources and un- sustainability. Similarly, OL_2, production function explains the under-utilisation of natural resources by the present generation.

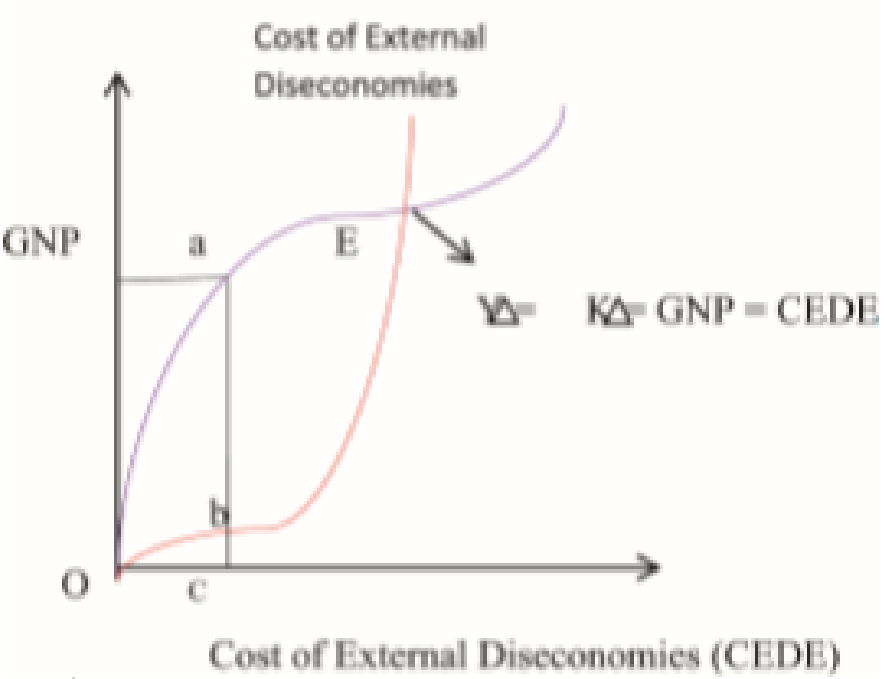

Figure 2. SNS Measurement

In figure 2, at point 'E' the rate of growth of income is equal to rate of growth of capital. After point 'E' there is no possibility for sustainable development. After this point the present generation ride on the future generation. At point 'a' GNP is greater than the cost of external diseconomies. That is ab > bc. Therefore the net economic welfare (ac – bc > 0) is positive enough to leave due share to the future. At the same time people in the present may live happily without suffering from external diseconomies such as air pollution, noise pollution, water pollution, etc.

CONCLUSION

The term sustainability is more abstract and subjective. Measurement of sustainability is possible if we able to estimate the value of manmade capital and natural capital. We also need the estimation of capital requirement for the present and future generation. But the measurement of capital requirement for the future as well as the present generation depends up on the level of technology of the present and future generation. Further, the capital requirement of the future, level of technology of the future and the total population in the future cannot be estimated. However, the PAM measurement indicates that the economics of sustainability is possible in a point where MPS is greater that the capital output ratio. The SNS measurement of sustainability indicates that the sustainability is possible where growth rate of income is equal to the growth rate of capital. This is also possible to estimate if we able to estimate the cost of external diseconomies. As long as the cost of external diseconomies is less than the total income of the country, the sustainable development is possible.

In conclusion, it is to state that sustainability is not necessarily viewed as the matter of distribution between the present and future but it must be viewed as a matter of survival of the present[4]. Over exploitation, wastage of non-renewable resources and man's invasion against the nature will create unfavourable environment to the present generation. Man's attempt to conquer the nature is like one who is digging his own pit, because, man cannot conquer the nature. Man cannot understand the nature. One should understand that the deviation from the nature is deviation from happiness. Therefore we can only follow the law of nature. Let us see how the present generation can be protected from the environmental

degradation. How to stop the damage or stein we put on the environment. The act of protecting the present generation from the external dis economics will automatically help the future generation. Let us hope for the eco-friendly production function and consumption pattern. Let we conclude that the real and peaceful life can be lived just by following the nature not by understanding and conquering the nature.

Ethical Clearance: Completed. (Dept. level committee at VELS)

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REFERENCE

1. David W.Pearce and R.Kerry, Turner, Economics of Natural Resources and the Environmental, Harvester Wheatsheaf, New York, 1999.
2. Jari kaivo-oja , Analysis of Historical and future problems of Sustainable development, Academic dissertation, University of tempere, Finland, 2004
3. Nick Hanley, J.F.Shogren and Benwhite, Environmental Economics in theory and practice, Macmillan India Ltd., 1997.
4. S.N.Sukumar, Myth and Realities of Sustainability in the UGC National Level Seminar held in Gobi Arts College, Gobi, 2004.
5. Andre,Rae, "Organizational Responsiveness to the sustainability paradigm ; A Comparison of Government Departments – Government sponsored Enterprises and private firms", International journal of Business and Transformation, 3(3), 8-15, 2011
6. Anna Heikkinen,"Discursive construction of climate change engagement in Business organization" dissertation, University of Tampere,2014, http://tampub.uti.fi
7. Li,Hong E, Xiao Xu Dong, et.al, 'A New Method and Applications of the Boudary value Problem of Differential Equation' Advanced Materials Research, 2014.