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Environment and Sustainable Development in India – An Overview

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Introduction:

Environment is a broad concept encompassing the whole range of diverse surroundings in which one perceives experience and react to events and changes. It includes the land, water, vegetation, air and the whole gamut of the social order. It also includes the physical and ecological environment. It concerns people's ability to adapt both physically and mentally to the continuing changes in environment. In its natural condition, the environment of any region is in a state of dynamic equilibrium. This is what is called the balance of nature. But when people try to exploit and interfere with nature, this equilibrium is disturbed, in many cases to the detriment of all forms of life. Ultimately, it is condition of land and water resources and the quality of the air, which one breathes that determine the health and wealth of a nation.

The Greek philosopher Aristotle used the spirit of sustainability in defining the term "Oikonomia" the root of the current term economics and contrasting it with an alternate form of development, 'Chrematistics'. Oikonomia is defined by Daly and Coob as "The Management of Household" so as to increase its value to all members of the household over the long run. Much as in the case of sustainable development, Oikonomia takes a long run perspective, considers the

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welfare of the household (or community) as a whole and recognizes the necessity of limited accumulation of suppliers if the needs of every one are to be satisfied over the long term. Unfortunately, most of the current economic activities are far from being characterized by the oikonomia. Human kind seems to be much more fascinated by chrematistics. The manipulation of property and wealth so as to maximize short-term monetary exchange value to the owner (taken from XIth Annual International Conference of National Environmental Science Academy Proceeding 1996).

The United Nations (UN) Decade of Education for Sustainable Development (DESD) 2005-2014 states that 'Universities must function as places of research and learning for sustainable development. The government of the United Kingdom has answered in the affirmative. Its Department for Education and Skills "shares responsibility for learning about sustainable development". Sustainable development has become an important issue on international, regional and national agendas concerning, education policy over the past few years, Articulating the goals of Higher Education Radhakrishnan Commission on University Education, 1948-49 put it in following words: "The most important and urgent reform needs in education is to transform it, to endeavour to relate it to the life, needs and aspirations of the people and thereby make it the powerful instrument of social, economic and cultural transformation necessary for the realization of the national goals. For this purpose, education should be developed so as to increase productivity, achieve social and national integration, accelerate the process of modernization and cultivate social, moral and spiritual values".

Various Approaches:

Number of studies conducted by social scientists on population, environment on sustainable development at global level and national level have been reviewed after taking accounts various issues and dimensions at all levels. Their main findings have been discussed in the following paragraph:

In order to produce effective indicators of sustainable development, one must agree on what one is trying to indicate. The challenge in developing indicators of sustainability is to find simple ways of presenting their concept despite the complexity and uncertainty. To incorporate the sense of time, a new kind of accounting, bringing in the temporal dimension is introduced which is called 'chrono-economics'. Any measure of balance must look at measures integrated over time to document processes and trends. Also, relative weights should be assigned to different indicators. Indicator values can be ranged on a non-linear scale, where more extreme problems or larger deviations from the desirable level carry more weight than small deviations. (Dahl, 1995)

There are an additional properties of a good indicator like parsimony, internal or external validity, understandability by various user groups, inter-connectivity among different sub-systems, and gender sensitivity. Many authors have come up with very specific indicators. Some of these focus on rural specificity (Gupta and Sinha, 1999). Some Indicators of sustainable rural development which are protection and development of village commons, sale of productive animals and percentage of underprivileged people involved in the development program to monitor ecological, economic and social dimensions (Rangekar, Soni and Kakade, 1999). Degree of livelihood support of rural people and poor farmers and indicators are increased opportunity for wage employment,

expenditures on food intake, wages higher than market rates, access to gains of common land for poorest households and enhancement in food grain security (Depinder Singh Kapur, 1999). An attempt has been made to measure of sustainability of rural development termed as index of habitat security based on farmers self analysis in Kelegama district of Sri Lanka. The author also studied in the context of Sri Lanka that literacy level and life expectancy have increased and level of infant and maternal mortality has decreased (Wickram Singh, 1999). The author focused on indicators such as factor productivity, crop yields, level of land degradation and deforestation. It was also found mention of ecological indicators such as land use changes, biomass quality, water quality and quantity, soil fertility and energy efficiency by Ramakrishnan, (1999) who has also noted that the indicators quality of life, health and hygiene, nutrition and food security and morbidity symptoms are useful for ascertaining the social status of society (Katar Singh, 1999). Malhotra (1999) clarified the definition of social sustainability and elaborated the concept. Mandavkar (1999) enumerated three criteria for indicators that are economic viability, management of technology and knowledge, equity for the sustainability and long-term productivity of a natural resource management program. All these indicators can be classified under social indicators. Mathew Sarvina (1999) traced historical background of the development scenario in Seychelles islands. Zan U Thein Win (1999) of Myanmar emphasized on strengthening of human resources and social development. Criteria and indicators have been discussed for the development of dry zones. Criteria for the dry zone are transportation, energy, and communication while that for socio-economic development are health, education,

poverty eradication, agriculture etc. Monfarad (1999) highlights role of rural and pastoral women of Iranian republic in respect of rural development. She suggested the need to adopt policies to train rural and pastoral women in agricultural and environmental issues and develop policies to eliminate health hazards.

Callens and Daniel (1999) state that firms should play an important role in the attainment of sustainability goals due to their central role in human activities and development. The paper contributes to the methodology of indicators that allow for the assessment of business participation into sustainable development. A fundamental standpoint is to view economic, social and environmental efficiency as a necessary step towards sustainability Hanley, Mciffatt, Faichney, and Wilson (1999) present results from a time series analysis of seven alternative measures of sustainability for Scotland. The measures chosen are Green net national product, Genuine savings, Ecological footprint, Environmental space, Net primary productivity, Index of sustainable economic welfare and Genuine progress indicator. These are all measures at the national or macro level. It has been noted that no one single measure of sustainability is likely to be sufficient.

Proops, Atkinson, Schlotheim, and Simon (1999), state a simple and minimal criteria for sustainability, that is the value of natural capital plus manufactured capital should not be decreasing. On the basis of any individual country or region, the above simple comparison may be misleading, as it does not take into account the production of goods for consumption in other countries or region, via international trade. A method of calculating a weak sustainability

criterion has been established for both the 'closed' economy approach and the 'open' economy approach.

TERI Project Report (2000) reviewed the indicators prepared by the Commission of Sustainable Development (1992) from a developing country perspective. The paper comments on the significance of the indicators as they relate to India and where required new modifications have been proposed. An effort has been made to bring out any differences in the national definitions or methodologies vis-à-vis the CSD (Commission of Sustainable Development). The indicators presented in the article have been classified into social, environmental, economic, and institutional as per the classification of the CSD (1992).

The aim of the paper by Button (2002) is to focus on the local environmental effects of urbanization and to consider ways in which they may be effectively treated within the confines of an isolated city context and more generally when urban areas are seen as part of a wider economic system.

Commission on Sustainable Development has adopted a work program on indicators for use by countries in measuring their own progress towards sustainable development. The OECD, one of the pioneers in indicator work has adopted a new focus on sustainable development. The multiple facets of complex environmental/developmental problems require many indicators to assure experts that all critical factors are being followed, it is not yet clear what is important or measurable with indicators to address a particular problem. Systems model would be required to understand and identify those large-scale systems parameters for which indicators should be developed.

Prugh and Assadourian (2003) are of the opinion that carrying capacity for humans are in large part self defined, because the limit on human population is not the maximum carrying capacity, but the cultural carrying capacity, which is lower. If everyone lives at a subsistence level, the earth will support more people than if everyone lives at a more comfortable level that requires more resources. The choices we are making now are placing a heavy load on the earth's capacity to support us. By one measure, the Ecological Footprint, we are now exceeding that capacity by about 20 percent. The margin will widen, probably at an accelerating rate, as our numbers and consumption rise.

The study has shown how through appropriate policy prioritization the states and union territories can mainstream environmental issues and follow, the sustainable development pathway. However it is quite evident from the current study that the areas of concern differ largely for the states and union territories. Unsustainability can result not only from environmental issue but from social and economic issues also. Hence a single policy for all of the states and union territories would not be the solution. Environmentally biased policies may also not be a solution towards achievement of sustainable development. Rather, judicious and different combinations of policies for different state; could help them in moving closer to achieving sustainability by moving on or beyond the benchmark.

Future urban forms for cities may include polycentric urban forms, closely linked to good public transportation systems; development that is directly related to transport; culturally appropriate increases in the density of development, that is responsive to the urban context; urban forms and buildings that take advantage of solar energy, and that take account of the life cycle of the development; forms

that interact with new technology: developments which enable accessibility and sustainable behaviour and involve the people who live there. (Dempsey and Jenks, 2005)

It should also be noted that sustainable buildings are important elements for dense cities. Buildings should be planned in such a way that sunlight penetrates the buildings. However, the right sustainable urban form and buildings are necessary but not sufficient conditions for sustainable city form. It is "behaviour, lifestyles and people's aspirations" that make an environment sustainable. (Dempsey and Jenks, 2005)

Initial findings indicate that from 1990 to 2002 India failed to achieve any noteworthy progress in the management and development of energy sector especially in the areas of cleaner and renewable energy. The absence of a holistic energy policy and the increasingly reliance on road transportation are further worsening the situation. More funds need to be allocated towards rapid upgrading and expanding India's railway infrastructure. The application of improved road taxes for transport vehicles is necessary.

In order to promote the effective use of renewable energy sources, which has tremendous potential in a vast country like India, strong, committed leadership is urgently required. The public sector oil-distributing companies such as the Indian Oil Corporation Ltd., and the Hindustan Petroleum Corporation Ltd., which have huge distribution network all over India including in the remotest villages, should be asked to distribute different renewable energy items such as solar lanterns, solar panels etc. The existing retail sump outlets and kerosene/lubricant depots can be used as sales and service centers for such items. Basic

engineering skill pertaining to the servicing of solar panels and small windmills can be taught to local students through workshops and training. The public sector oil companies with their massive, nation-wide infrastructure could organize this educational component on a regular basis in different locations. The training and promotional expenses towards this would be less compared to the amount of subsidy the companies pay each year to sell kerosene to the underprivileged section of the rural and urban India. (Dipankar Dey, 2006)

Climate change: is one of the most important global environmental challenges, with implications for food production, water supply, health, energy, etc. Addressing climate change requires a good scientific understanding as well as coordinated action at national and global level. This paper addresses these challenges. Historically, the responsibility for greenhouse gas emissions' increase lies largely with the industrialized world, though the developing countries are likely to be the source of an increasing proportion of future emissions. The projected climate change under various scenarios is likely to have implications on food production, water supply, coastal settlements, forest ecosystems, health, energy security, etc. The adaptive capacity of communities likely to be impacted by climate change is low in developing countries. The efforts made by the UNFCCC and the Kyoto Protocol provisions are clearly inadequate to address the climate change challenge. The most effective way to address climate change is to adopt a sustainable development pathway by shifting to environmentally sustainable technologies and promotion of energy efficiency, renewable energy, forest conservation, reforestation, water conservation, etc. The issue of highest importance to developing countries is

reducing the vulnerability of their natural and socio-economic systems to the projected climate change. India and other developing countries will face the challenge of promoting mitigation and adaptation strategies, bearing the cost of such an effort, and its implications for economic development. (Jayant Sathaye, P.R. Shukla and N.H. Ravindranath, 2006)

Lethargic approach to economic imperatives may seriously undermine the groundwork for sustainable development. Institutions of higher learning ought to be a major force in society not only for producing leaders in science and technology, but also for downstream channeling of progressive social, moral, and political values while keeping in perspective temporal realities, and spatial constraints. That said, five major interests universally considered to be at stake in national higher education systems include social justice, competence, academic freedom, autonomy vs. accountability, and decentralization vs. centralization. Higher education reform efforts aim at independent, strong, and objective analysis of ground reality. A clear sense of direction and pace will help in optimally balancing out the apparent tradeoffs in favour of sustainable development. The central objective of the 11th plan is now focused on Expansion of enrolment in higher education with inclusiveness, quality and relevant education and supported by necessary Academic Reforms in the University and college system in India. There are necessary that individual state and central government also take similar initiative in their respective state plan and develop policies to address the issue of increasing the enrolment rate, equal access to groups with lower access to higher education, issue of quality, relevant education and various academic reforms. (Nidhi Sharma, Priti Verma, Pravin Kumar, 2008)

It was found that CSI as a measure of sustainability status is sensitive to the components of the index. So as a future research agenda it will be useful to take up the issue of the possibility of identifying by some means the most important components as standard components across time and space to arrive at CSI. This report could have been more informative if we could have/got all the data required to carry out such an exercise. But from a practical point of view, non-availability of data-for different states for a large number of indicators acted as a major constraint. Given these limitations, this exercise can be regarded as a first and modest attempt to assess the positions of the states and union territories of India on the development pathway through construction and comparison of one single index of sustainability. (Joyashree Roy, 2009)

It emerges that India has a plethora of laws, which deal with the three pillars of sustainable development – environment, social and economic (including trade and IPR legislation). Most of these show a high degree of integration or interrelationship between the different pillars of sustainable development, an important feature of sustainable development law. To cite an example, the Biological Diversity Act seeks to conserve bio-resources as well as provide legal entitlements to the communities who have maintained them over centuries as well as enables them to benefit economically from the resource. In a similar fashion, the Forest Rights Act recognizes social and economic rights of forest dwellers and forest dependent communities and reconciles with the necessity of creating protected areas for wildlife. Similarly, MNREGA sets out to achieve sustainable development in a comprehensive manner – providing a legal right to livelihood to rural people. While eradicating rural poverty and ensuring food

security, it also seeks to protect the environment with employment being suggested to deal with environmental issues like drought, deforestation and soil erosion. In fact, this trend to integrate two or more pillars is more discernible in post-Rio legislation than the earlier ones. For instance, the Wildlife Protection Act in its original form did not recognize the rights of forest dependent communities, but an attempt to have a more participatory and inclusive approach is seen in the later amendments.

While there has been remarkable progress in Indian legal provisioning on sustainable development, a few challenges continue to exist particularly with respect to implementation. It is well recognized that key to improved implementation is the capacity building and improved financial and technical resourcing of executing agencies. (Sustainable Development in India: Stocktaking in the run up to Rio+ 420, Ministry of Environment and Forests Environment of India, 2011)

Though India has made significant progress in terms of achievements across the pillars of sustainable development many problems continue to persist. New threats are also posing new challenges to the country, though there has been reduction in poverty levels in the country, there is a need to stop further poverty eradication and inclusive development. The depletion of natural resource and development in environmental quality needs to be addressed on an urgent basis. (Sustainable Development in India: Stocktaking in the run up to Rio+ 420, Ministry of Environment and Forests Environment of India, 2011)

As the global economy has grown and developed, issues related a sustainable development are receiving increased importance at the international

level. One of the ways in which India has shown its increased commitment towards sustainable development is through its growing participation in various international agreements. India was one of the initial signatories to the GATT that was created with the key objective of promoting global free trade. With liberalization of India's foreign investment policy India has entered into several bilateral investment promotion and protection agreements (BIPAs). India has also strengthened its global position towards social development and is a charter member of the United Nations and participates in all its specialised agencies. Further, India has been active in all international forums relating to environmental protection and has acceded to almost all major multilateral environmental agreements and has established domestic policies and legislations complimenting these international obligations and pledge. (Sustainable Development in India: Stocktaking in the run up to Rio+ 420, Ministry of Environment and Forests Environment of India, 2011)

Financial inclusion is encouraged mainly by the introduction of Self Help Groups and Kisan Credit Card for providing credit to farmers. From 2005 onwards, "Financial inclusion" was explicitly made as policy objective and thrust was on providing safe facility of savings through "No Frills" accounts. However, the high operating costs in remote areas and the small size of the transactions act as a constraint towards extending these services further. Extending credit to the underprivileged section in the rural and urban areas will enable us to attain the twin objectives of growth and poverty alleviation. But to achieve this, the government should provide a less perspective environment in which banks are free to pursue the innovations necessary to reach low income consumers.

Needless to say, at least initially no private financial entities will venture into this territory and government has to share the burden of becoming initiator of such financial inclusion. Financial service providers should learn more about the consumers and new business models to reach them. Inclusive Growth seems to depend, to a considerable extent, on the success of the credit delivery system which is supposed to extend its support to this process of generating employment, and in effect correct the prevailing income distribution in the country. All the measures mentioned are necessary, and merely making "Inclusive Growth" as one of the main objectives, in the 11th Five Year Plan is probably not sufficient. (Abhijit Mukhopadhyay, 2011)

With the passage of time it has become hard to avoid a general sense of deep environmental vulnerability and insecurity. The direct fallout of this environmental decline will be borne by the poor and the already deprived. Therefore, each action in this context must be seen from the perspective of the most underprivileged. The entire global community has to work towards this issue. More than a question of an agreed or a binding commitment it is more importantly a question of the division of fair responsibilities among nations considering historical responsibilities, development processes, the objective of poverty eradication, and capacities to provide resources of different countries. (Economic Survey, 2011-2012)

The study conducted by Planning Commission, Govt. of India, identified the following issues. Firstly, although mining has brought about economic benefits, avoidable environmental and social damages continue to occur in the mining areas. A major reason is the ineffective implementation of the existing

mining and environmental laws and regulations providing for corrective and mitigation measures (such as compensatory afforestation, land reclamation and prevention of illegal mining). In some areas mining operations have been taken up and expanded without taking into account the "carrying capacity" of the local environment and available infrastructure facility. This has caused avoidable discomfort and inconvenience to the local population. Sustainable development is interpreted primarily in terms of environment protection and management. Site-specific environmental measures are the main focus of action and other dimensions of sustainability such as local stakeholder engagement and consultation, benefit-sharing with local communities, creating infrastructure, human and social capital in mining project areas and transparency in communication and accountability do not receive much attention from mining enterprises.

Further, there is a large variation in the environmental behavior of mining enterprises. While larger mining companies have concerns for scientific mining, environmental protection and limited socio-economic development (through CSR activities), smaller enterprises are focused on maximum extraction of mineral resources from their lease areas. (Planning Commission, May, 2012)

Possibilities to improve the efficiency in domestic water supply, transportation and agricultural activities to reduce women's energy use and increase their efficiency should be explored. Research aimed at alleviating the drudgery and improving the health and safety levels of women should include development of specific tools and machines. Care should be taken that such

tools and machines do not displace women from their employment opportunities or convert female jobs into male jobs.

Policies in the ease of large and small scale electricity production programmes should help women to have equal access because such programmes provide benefits to both men and women in a community. Decentralised production of energy using renewable resources should aim at creating employment opportunities for local women. The role of and benefits to women in JFM and integrated land use planning should be addressed if the development has to be sustainable and equitable. Also, the scope to increase the employment opportunities for women in JFM and integrated land-use planning like nursery-raising and dairy farming should be explored. Women should have access to information on any new invention.

The majority of rural women live close to the biological subsistence margin. Access to fuel, fodder, small timber and other NTFP is vital for their survival. Understanding the gender roles, the struggle of women for access to and control over energy resources, their involvement in biomass management from various perspectives is necessary to integrate the needs of women in energy development programmes. The entire process should ultimately aim at solving the most critical problem of women and energy, leading to sustainable development. (R. Shailja, 2012)

Environment has emerged as a dominant force influencing development-planning efforts. Sustainable development is the process of judicious use and conservation of natural resources for the overall improvement in the quality of life for the present and future generation on long term basis. It should be based on

principles like Development for all which must be within the limits of environment, having respect for quality of life, taking into account the socio-cultural and traditional knowledge base which promote collectiveness global diversity, people's participation in natural resources management and need for future generations. It should be placed at the top priority while formulating plans for development. (Dipakala and Jasavaprabhu Jirli, 2012)

There are many city forms that have been suggested in the literature to solve the problem and make sustainable cities. This paper discusses two of them, the first one being that of the idea of compact city and the second one is that of multi-modal urban region. It explains the pros and cons of the compact city form and applicability in different countries with different densities. The two main benefits of compact city are reduced dependency on private cars and preservation of greenery while the main costs are more air pollution, noise and crime and overcrowding. It also refers to the recommendations of National Commission of Urbanisation of India, which makes a case for low-rise high density built form for Indian cities. The two important issues about high-density cities are (1) the costs and benefits of the form, and (2) how dense should it be and "higher than what"? Then the study discusses the concept of multi-modal urban region. The idea here is to create an environment friendly transport system and create activity places reachable within reasonable time. In order for this to happen, activity locations need to be created which can be reached (1) without moving, by walking, by cycling, (2) by public transport, (3) by energy efficient cars. There are important implications of this on transport and land-use policies. (Basudha Chattopadhyay. 2012)

Thus, there are number of issues and dimensions related to population, environment and sustainable development in India which have been discussed by the various social scientists at different levels. However, there is still need to conduct the research studies on these aspects due to socio economic transformation in the economy.

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