SUSTAINABLE DEVELOPMENT INDICATOR TOOL FOR INDIAN INDUSTRIES

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Abstract
Today, the threat to the environment is high on industrial agenda in many countries and there is every reason to believe that it will stay there for a long time to come, although local issues may still temporarily overshadow the long term impact on the environment as a result of human activity. The World Commission on Environment and Development (WECD) foresaw the possibility for new areas of economic growth, based on policies that sustain the environmental resource base. A central finding of all country studies confirm that economic policies and environmental trends are closely linked but often in the ways that have not been widely recognized. Since economic policies must be designed increasingly in terms of their sustainability. Environmental economics has been a considerable success in the sense of sustainability of natural resources that is probably the most important sense. So, it can be used as advanced technology to understanding our environmental problem: the way they arise, and the sorts of policies that can lead to desirable improvement.

Keywords: Sustainable Development, Environment Problem

1. Introduction

Our environment includes all elements, factors, and conditions that have some impact on growth and development of certain organism. It includes biotic and abiotic factors that act on an organism, population, or ecological community and influence its survival and development. Human have begun to degrade all kinds of natural resources because of increasing demands of the growing population, use of advance technology for resource use as well as increase in per capita resource consumption. According to the State of the World 2004, the global consumer class (user of television, telephone and the internet, along with the cultural and ideals these product transmit) constitute more than the quarter of the world (some 1.7 billion people). Almost 50% of this class now lives in developing countries, which also have greatest potential to expand the rank of consumers. Forest, wetlands and other natural places are shrinking to make way for the people and their homes, farms and factories. More than 90% of paper stills come from trees, which accounts for consumption of about one fifth of the total wood harvest worldwide. Cars and other forms of transportation account for nearly 30% of the world energy use and 95% of global oil consumption. Therefore, it becomes important to prevent the degradation of natural resources and carefully manage them to ensure their sustainable utilization. Resource conservation involve using, managing and protecting resources so that they are not wasted, depleted or degraded and are available on sustainable basis for present and future generation (Singh J.S,Singh S.P,Gupta S.R Ecology, Environment and Resource Conservation, Anamaya Publishers New Delhi, p-599-613)

2. Footnotes

In this paper Environmental economics is concerned as the tool for showing the impact of economic activities on the environment, the significance of ecosystem to the economy, and suggests the appropriate ways of regulating economic activity, so that cosmic balance is achieved in the society. There are three main principal dimensions of sustainable development: Economics, Social and Environment (Ecology). In entire environment our ecology deals with numerous and varied component of nature, which can be categorized variously (climate, soil, litter lying over soil, plant, animal, production, decomposition, diversity, dominance etc.) and the linkages existence between them while the term economics comes from the Ancient Greek (oikonomia, "management of a household, administration") from (oikos, "house") (nomos, "custom" or "law"), hence "rules of the house(hold)" and it is a part of social science that analyzes the production, distribution, and consumption of goods and services. Alfred Marshall defined economics as: "a study of mankind in the ordinary business of life; it examines that part of individual and social action which is most closely connected with the attainment and with the use of the material requisites of wellbeing. Thus it is on one side a study of wealth; and on the other, and more important side, a part of the study of man." Alternatively, economics could also be defined as the study of scarcity. Environmental economics is generally viewed as a form of progressive economics, trying to account for various forms of market failures to better model markets in the future and lead to more widespread gains among people. So, there are three important "organizational" issues have to be considered at the outset of any application of environmental economics; Definition of the main...
problem and choice of the appropriate economic assessment approach; Definition of the scope and limits of the analysis and the information required for the chosen assessment Approach; and Definition of the data collection method and valuation techniques. For enhancing the environmental impact of production and consumption of developmental activities, Environmental Economics is one of the appropriate ways for formulating environmental policies and implementing it for developmental activities with the help of sustainable development. So, it can be defined as a part of economics which deals with the inter relationship between the environment and economic development. It also concerned with the impact of the economy on the environment, and analyses the allocation problem posed by the use of environmental resources. According to (National Bureau of Economic Research Environmental Economics) "Environmental Economics undertakes theoretical or empirical studies of the economic effects of national or local environmental policies around the world. Particular issues include the costs and benefits of alternative environmental policies to deal with air pollution, water quality, toxic substances, solid waste, and global warming."

In industrial sector environmental management and recovery of natural resource become quite necessary in term of sustainable development because of heavy pollution load so if, we concern about the sustainable development then it can be emphasizes that the rate of consumption and use of natural resources must approximate the rate at which these resources can be substituted or replaced. At the same “time, it requires that society is able to satisfy social, economical and other needs without affecting the interest of future generation. Sustainable development has been defined as:
(a) Living on the planet's income without depleting nature's capital;
(b) Meeting the need of today's population without compromising the ability of future generation to meet theirs;
(c) Managing natural, human and financial assets so as to increase long-term wealth and wellbeing.

To address the issues of environmental problem, we have an elaborate legal and organizational framework for environmental management. There are some aims of that organisational framework are:
• Ensuring the industrial activities which are compatible with sustainable development without destruction
• Industrial activity does not disrupt the ecological system through overexploitation of natural resource.
• Incorporate the cost of rectifying any expected detrimental environmental effect.
• Identify the specific pollution causing sector and amendments needed in the existing corresponding environmental legislation for pollution control in industrial sectors.
• Identify new and innovative approaches for environmental management and pollution control.
• Address the unforeseen environmental problems and to develop effective legal solution for restraining them.
• Inadequate monitoring of industries and enforcement of regulation.

So, each State government and the Central Government should declare their environmental policies from time to time so that the level and extent of environmental destruction can be minimized through laws-

3. List of Environmental Legislation in India

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<th>Year</th>
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<tr>
<td>1974</td>
<td>The Water (Prevention and Control of Pollution) Act</td>
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<td>1975</td>
<td>The Water (Prevention and Control of Pollution) Rules</td>
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<td>1977</td>
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<td>1981</td>
<td>The Air (Prevention and Control of Pollution) Act</td>
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<td>1982/83</td>
<td>The Air (Prevention and Control of Pollution) Rules</td>
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<td>1986</td>
<td>The Environmental (Protection) Act</td>
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<td>1986</td>
<td>The Environmental (Protection) Rules</td>
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<td>1989</td>
<td>The Hazardous Waste (Management and Handling) Rules</td>
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<td>1989</td>
<td>Manufacture, Storage and Import of Hazardous Chemical Rules/ Amendment Rules, 1994</td>
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<td>1991</td>
<td>The Public Liability Insurance Act</td>
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<td>1991</td>
<td>The Public Liability Insurance Rules</td>
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<td>1992/93</td>
<td>Environmental (Protection) Rules - &quot;Environmental Statement&quot;</td>
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<td>1993</td>
<td>Environmental (Protection) Rules - &quot;Environmental Standards&quot;</td>
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<td>1994</td>
<td>Environmental (Protection) Rules - &quot;Environmental Clearance&quot;</td>
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<td>1995</td>
<td>National Environmental Tribunal Act</td>
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<td>1996</td>
<td>The Environmental (Protection) Rules - &quot;Environmental Standards&quot;</td>
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<td>1997</td>
<td>Prohibition on the Handling on Azodyes</td>
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<tr>
<td>1997</td>
<td>Amendment in the Environmental (Protection) Rules, 1997.&quot;Public Hearing&quot;</td>
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So, the specific purpose of the environmental Economics is to enable the user to analyze and value the economic costs of land degradation, and the benefits of sustainable land management. The Toolkit comprises five complementary tools: (i) Selection of the appropriate assessment approach; (ii) Identification of ecosystem functions and services; (iii) Bio-physical assessment of ecosystem services; (iv) Economic valuation of ecosystem services; and (v) Ecological-economic modeling.

In the subfield of Environmental Economics some macroeconomic policy also has to be formulated for managing the environmental problems.
• Pricing of natural resources (water, forest, land, energy)
• Pricing and subsidization of agricultural input and outputs
• Exchange rate and trade control
• Government taxes
• Government expenditure between urban and rural areas


In India, environmental protection and conservation of natural resources emerged as key national priorities in the wake of the 1972 Stockholm Conference on Human Environment. Between 1972 and 1992 India has been able to develop a stable organizational structure for environmental protection in country. At the same time an on-going process of economic reform and trade liberalization is bound to accelerate the process of industrialization and trade. This fact, coupled with the significance accorded to export in India's economic reform, will have a significance impact on environment in various ways. The evolving macro-economic framework will be mixed insofar as our environmental priorities are concerned. It is required that the potential adverse environmental effects of the new economic policies regime are minimized if not eliminated. It has been demonstrated that there is a positive relationship between trade liberalization, growth in per capita income and environmental quality. But studies by the OECD and World Bank show that a positive correlation between trade liberalization and environmental protection is not an automatic process. In India looking at a broad macroeconomic scenario, during the last three years or so, the GDP is growing at an average annual rate of nearly 7%. This is a significant improvement over the average of 5.5% annual GDP growth during the last decade. Inflation rate is low at around 4.0%. The fiscal deficit ratio is expected to be 4.5% during 1997-98. The increase in export has been from US$26.3 billion (1994-95) to US$31.8 billion (1995-96). Industrial production shows 6.7% rise from 3995-96 in 1996-97. The per capita income in 1994 was US$320. Thus the present status definitely shows an encouraging picture from the point of view of economic development. The liberalized, growing economy will certainly have a substantial impact on the environment.

These impacts include pollution load on air, water and land and the dwindling of forest reserves. But over the last few years there has been a shift towards a "greening" market specially in the developed country. India, a developing economy, is one of the most populous countries in the world. It is imperative that the environmental issues be addressed urgently as statistic show that environmental protection, specially at a national plate form, needs to be addressed urgently (Mookherjea.aloke (et.al.) 1998 International Environmental Agreements'. Challenges and Opportunities, Challenges for Economic and Environmental Policies in Developing Countries: Case of India). Industrial ecology has been guided by the quest for production and consumption processes that minimize waste generation and, thus, environmental impact (Matthias Ruth 2004). Comparatively little research is carried out within industrial ecology on consumption processes, yet it is here where many decisions on total systems impact are made—if consumption expands faster than efficiency improvements, then total environmental impacts will rise (Waggoner and Ausubel, 2002).

5. Major Challenges of Environmental Economics in Indian Industry

India is a signatory to several Multilateral Environmental Agreements (MEAs) which use various trade measures as a means to help and achieve the environmental objective, some of the important ones are the Basel Convention, Montreal Protocol and the Framework Convention on Climate Change. These agreements contain various tools, import and export restrictions, quotas, notification and consent procedures, provisions banning trade with non-parties etc. The Montreal Protocol was framed in 1989 and India becomes a signatory in 1992. Being a party to it, our industry has a commitment to phase out ozone depleting substances (chlorofluorocarbons (CFCs) and halos) by the year 2010. The involved areas are air-conditioning, refrigeration, fire extinguisher aerosols, pesticides, solvent using industry etc. There are several barriers in the path of implementation which can be broadly classified as follows:

• Unavailability of adequate finance
• Identification process is proving to be a marathon task as most of these industry units are of small scale
• Scarcity availability of alternative substance like aerosol

India, with its growing economy, will have to address the issue of a fast deteriorating environment quality urgently in the coming years. The exiting legislation should be aimed as responsible industrial behavior the present law need to be reoriented to accommodate the fast increasing pollution load in the country. It has been shown that there are three major problems due to heavy pollution load -

I. Depletion of resources.
II. Dependence on outside subsidies.
III. Disruption of natural cycle.

With the globalization of the Indian economy, trade and environment have become two sides of the same coin. Increasingly, there is a tendency to entwine the environment issues with trade. Because, our economy is an open subsystem of the larger closed environmental system, so the economic process is sustained by the irreversible, unidirectional flow of low entropy energy and materials from the environment, through the economic system, and back to the environment in the form of high entropy, unavailable energy and materials (modified from Hall et al., 1986 and Goodland et al., 1991). Historically, manufactured capital and natural
capital have been developed as complements, not substitutes (Daly, 1991). The stock of manufactured capital such as tractors, oil rigs, and fishing vessels has been increased with the express intent of increasing the use of natural capital such as fertile soil, oil deposits and fish populations. As Costanza and Daly (1992) observe, if manufactured and natural capital were perfect substitutes, there would be no need to develop and accumulate manufactured capital since an equivalent form already exists! A substantial amount of empirical work needs to be done to appropriately measure and represent human and natural capital in quantitative models of economic production, and to measure the potential for substitution between them. There is a conspicuous gap in our knowledge of the role played by ecosystem services in production. (Cutler J. Cleveland, Matthias Ruth 1996). This is expected to further the pressure especially on the developing countries. The pressure has already been felt in certain sector like textile and leather. Hence, this is one of the most important challenges facing developing countries like India urgently (Mookherjea.aloke (et.al.) 1998 International Environmental Agreements: Challenges and Opportunities, Challenges for Economic and Environmental Policies in Developing Countries: Case of India).

6. Environmental Economical - Sustainable Developmental plans for Indian Industry

Sustainable development is a global concept and the preconditions for sustainable development are equity and social justice, economic efficiency and ecological harmony. Sustainability (from the Brundtland Commission Report-Our common Future) is...a process of change in which the exploitation of resource, the direction of investment the orientation of technological development, and all in harmony and enhance both current and future potential to meet human needs and aspirations.

The main Agenda for sustainable development has a focus on carrying capacity based sustainable development; structural changes in economic sector and preservative environmental planning. Conservation based development is needed to protect the structure and function as well as diversity of natural ecosystem with a focus on following aspect:

- Conservation of life support-system and ecological processes
- Conservation of biological diversity in terrestrial, freshwater and marine system
- Sustainable use of resources
- Minimizing depletion of natural resources
- Stability of the earth's carrying capacity
- Improvement of the quality of life including social and economical concern.
- Develop a national framework code to integrate development and conservation.

In order to move towards sustainable development path, India has developed an ECO - MARK scheme. This scheme confined to consumer product which includes soap, detergent, paper, architecture paints, plastic, lubricant oil, aerosols, food items, packaging material, wood substitute, textile, cosmetics, electrical and electronic goods, food additives, batteries and so on. In the context of development of the International Organization for Standardization, ISO 14020 series, there is need to review the schemes requirement as well as review of requirement of the schemes which is inhibited it's take off with the Indian Industry. Sustainability recognizes an integrated view of the world through the use of multidimensional indicators that shows the link among a community's economy, environment and society (For example, the gross domestic product(GDP), a measure of the country's economic well being, measures the amount of money being spent in a country. Generally, the more money spent, the higher the GDP and betters the overall economic well-being. However, because GDP reflect only the amount of economic activity, regardless of the effect of that activity on the community's social and environmental health, GDP can go up when overall community health goes down. So, environmental sustainability has a main focus on maintenance of biological diversity, atmospheric stability and ecosystem function and services.

Fig. 2. Overlapping view of three system of sustainability

Fig. 2. shows the global capitals comprising natural system and the built system are interdependent and interrelated and form basic measurement sustainability (Source from-Ecology Environment and Resource conservation)
In the 1980s however, the concept of sustainable development challenged the idea that environmental protection and economic development were incompatible.

This concept holds that economic development and environmental protection can go hand in hand (UN, 1987). It is being increasingly recognized now that there is a scope for market based approaches to environmental regulation, largely because of the worldwide adoption of market philosophy and development of suitable market mechanism (Garrod and Willis 1999). So, the contribution of environmental economics is to "value" environmental resources necessary for reaching sustainable development by establishing the following parameters:

- Valuing resources helps to identity damages or improvements caused by alternative natural resource uses,
- Estimating environmental value in economic terms creates market incentives for protecting that value against over-use of natural resources.
- Valuation also increases national and local level environmental awareness strengthening the commitment towards the implementation of environmental initiatives.
- Valuation reaches the attention and vision of Economic and Finance Ministries to increase protection investment and undertake more effective measures and policy reforms. Each environmental function has economical value attached to various attribute as shown in Fig.

Fig 4. Shows various preferences methods for environmental valuation (adapted from Garrod and Willis 1999) So, managing the environmental economical balance it will be needed to equip with the ability to adapt to economical policies as well as environmentally-related product standards and technical regulations, such as the ISO 14000, packaging, labeling, recycling, and intellectual property rights requirements, in order to maintain and improve competitiveness. The private sector will also be encouraged to develop niches in environmental technologies and product in view of the expected increase in the demand for these technologies and product like in India, there are several environmental laws passed by both States and Union Governments.

7. Conclusion

It can be concluded that a frame-work and methodology suitable for India needs to be developed to conduct Environmental Economic evaluation for natural resources, which is required to be a part of Legislation.
References

[3] Mookherjea, Alok (et.al.) 1998 International Environmental Agreements: Challenges and Opportunities, Challenges for Economic and Environmental Policies in Developing Countries: Case of India, pg 89-103

Biographies

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