

Business and Environment

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ABSTRACT

Businesses do not operate in a vacuum. The social environment, the political environment, legal environment, economic environment all play a crucial role in which a business system operates. Unfortunately, the ecological environment in which everything exists is not fully appreciated by businesses. Rather, the environmental costs are ignored and are externalized totally to be borne by the society at large. Over a period of time such a neglect has led our country to a situation where the industrial growth model has become a non-sustainable model. The evidence of this is seen in the form of mass protests, agitations and court litigations in several parts of the country against setting up of industries and ongoing industrial units. Major industrial investments are getting blocked due to neglect of environmental concerns and livelihood issues of the local people. In the case of extractive industries like coal and minerals, the problem assumes gigantic proportions.

It is true that industries have taken environment for granted. The industrial technology and modes of production have led to widespread pollution of air, water and soil in India. It's true that the ecosystem provides various goods and services to the society but they have not got the due recognition. This paper provides a theoretical framework of the immense contribution of ecosystem goods and services to businesses and society at large. Unless businesses and planners take into account this aspect, decisions will be taken that will lead to more severe degradation of the natural resource base.

Our national income also does not factor into the contribution of ecosystem goods and services. A national income statement is presented but not along with a national balance sheet. When forests are cut for timber, the value of the timber gets added to the national output. But the consequent loss of forest ecosystem goods and services is not reflected anywhere. In fact, loss of national assets is shown as an accretion to our national income! Similarly, when a decision to construct a dam is taken, it is easy to quantify the water that will be available for irrigation, water supply, electricity to be generated and so on. But the ecological loss of biodiversity, soil, wildlife, forests in the form of groundwater recharge, sediment control, rainfall and weather pattern, are never considered because they are hard to quantify. There are social costs in the form of loss of habitat for the locals, displacement costs, loss of livelihood, loss of cultural values and many more.

Neglect of ecosystem goods and services has meant that industrial projects are given clearances without adequate caution. This has systematically led to a situation that most Indian rivers stand highly polluted, the ambient air quality is toxic to humans and others, the loss of top soil nutrients is more than the total fertilizer production in the country. It is high time that we switch over to a more sustainable industrial growth model. Climate change uncertainty and loss of biodiversity are going to affect industries in a manner that would call for a new approach to industrial management.

The results of the review of literature that has explored the economic and other values of ecosystem goods and services are

presented in this paper. Valuation/ quantification of such goods and services is now possible but this paper does not go into the details of putting a price tag on each of these goods and services.

Keywords

Business Environment, social environment, the political environment, legal environment, economic environment

1. INTRODUCTION

This paper highlights the contributions of ecosystem services to business systems and policy. Businesses have far too long not recognized the contribution of such services by nature. This has resulted in reckless use of natural resources. They have been taken for granted with the result that pollution caused by industries to air, water and soil have reached a critical point. Laws are put in place but the responsibility of adhering to them rests with the industries. In the absence of such commitment, pollution has taken a heavy toll on the society's health and well-being. This is a larger corporate social responsibility besides the mandated corporate social responsibility.

A theoretical framework is presented regarding ecosystem services and their valuation. Being mostly intangible, placing a value on such invaluable contributions is not an easy task. Yet corporations do value intangible as goodwill and show them in balance sheet. Similarly, if ecosystem services are valued, a correct picture can be arrived regarding the contribution of corporation to the social well-being. Ecosystem services valuation goes much beyond the traditional social cost benefit analysis. In India where over 70% of population depends upon agriculture and allied activities including forestry, valuation of ecosystem services assumes center stage. A projects profitability when seen after considering the ecosystem services may be quite different from what it would have been otherwise.

2. CONCEPTS AND METHODS

The realization that natural systems support human welfare is very old. The idea of ecosystem services is mentioned several times in Indian classical texts. As early as 400 BCE, Plato gave interface of deforestation and water. Economists had always included land as a factor of production. Balance sheets of corporations show land as an asset. Relationships between natural and social systems was formalized by George Perkins Marsh in *Man and Nature* in 1864. He stated that large scale damage to natural systems by humans will reduce human welfare. The concept of ecosystem services started during the 1970s picked up momentum thereafter.

New ecological concepts, models, and methods started during 20th century and continued thereafter. Putting a value to ecosystem services in formal economic methods for nonmarket valuation. Ecosystem services analysis now take into account complex issues such as the relationships between ecological, social and economic systems, and their effect on human

welfare. Also discussed are the suitable methods to quantify different types of ecosystem services.

Ecosystem services includes all the services we get from the natural world that can easily go unnoticed and so not accounted for. It includes provision of water, soil, sediment control, erosion control, storm and cyclone control, pollution abatement, moderation of climate change, and resilience from natural disasters. Ecosystem services of natural world directly or indirectly benefit humans and increase social welfare. Direct benefits include clean air, water and soil, provision of wild foods, famine foods, recreation and rest, construction materials and so on. Indirect benefits include inputs into the production of other goods and services. Earthworms enriching the soil leading to enhanced production is a classic case of ecosystem services. Flood prevention by mangroves, pollination by bees and birds are other examples of ecosystem services.

Ecosystem services are not usually traded in markets. So market activities fail to capture the benefits provided by such services. The degradation of natural wealth by markets is therefore not a surprise. The United Nations Millennium Ecosystem Assessment (2005), assessing the result of ecosystem change, held that humans have been mainly responsible for reducing the ability of Earth's ecosystems to contribute to social welfare. Proper ecosystem services analysis can help formulate policies that take into account all the benefits and costs of actions affecting those services. Unfortunately, most formal evaluations of ecosystem services are restricted to examine the consequences of changes to some services within a certain geographical area and for certain beneficiary groups. The entire ramifications are thus ignored. Ecosystem services were made well known by clear definitions by the United Nations 2004 Millennium Ecosystem Assessment (MA). This study spanned over four years involving scientists from around the world [1]. The four broad categories in which the study has eventually grouped ecosystem services are:

2.1 Provisioning services

- Food including seafood, bush meat, cultivated and wild crops and spices
- Water
- Medicines, biochemical, and products
- Energy like hydropower, bio-fuels, solar, wind

2.2 Regulating services

- Carbon sequestering and regulation of weather
- Waste disposal breakdown and neutralizing toxic wastes.
- Improving water, soil and air quality
- Seed dispersal and pollination
- Pest and disease control

2.3 Supporting service

- Nutrient cycling and dispersal
- Primary production

2.4 Cultural services

- Cultural, intellectual and spiritual dimensions
- Recreation, rest, ecotourism and study
- Discovery of genes and species

3. ECOSYSTEM SERVICES AND BUSINESS

Degradation of ecosystem services can seriously affect the performance of a business. At the same time immense business opportunities can be taken advantage of with restoring and

enhancing ecosystems. The risks and opportunities associated with this include:

3.1 Operational

- Higher costs for freshwater due to severe scarcity for businesses.
- Low hydroelectric generation due to siltation.
- Building solar units to avoid transformer cost issues and maintenance.

3.2 Regulatory and legal

- Risks include penalties, temporary closure, and expensive lawsuits for damage to ecosystem services from corporate activities.
- Opportunities to promote policies and incentives by Government to maintain ecosystems that provide services to the corporation.

3.3 Reputational

- Risks of being targeted by local communities for depleting groundwater.
- Opportunities such as building environment friendly brands for market differentiation.

3.4 Financing

- Risks such as banks imposing restrictions on loan requirements.
- Opportunities in the form of favourable credit availability from financial institutions to firms that engage in responsible environment behaviour.

Sadly, many business concerns are ignorant of their dependence on the natural world and the impact of their operations on ecosystem health and their side effects. Environment impact assessments are usually done but never environment dependence. However, many tools are available now that can help businesses value and assess ecosystem services. Some such tools are the Corporate Ecosystem Services Review (ESR),[2] Artificial Intelligence for Ecosystem Services (ARIES),[3] and the Natural Value Initiative (NVI) [4].

As human populations rise, demands imposed on ecosystems rise too. Natural resources are scarce, often fragile and not abundantly available. Air, water, and soil quality are deteriorating rapidly whether in urban or rural areas, rivers are highly polluted, major fish catches are depleting enormously, deforestation gaining momentum, ice caps melting, viruses and diseases are spreading. Biodiversity loss, global warming and climate change have added new dimensions to ecological problems.

There is increasing realization that ecosystem services are heavily compromised by human activities. There is very little time left to study long-term ecosystem health and its impact on human habitation and economic activity. Are business corporations paying heed to the urgency of the problem? By simply assigning economic values to ecosystem services based on the cost of replacement with anthropogenic alternatives is not working. Assigning values to nature based on biodiversity banking, is transforming the way we recognize and manage our environment, our future, business opportunities and social responsibility.

4. VALUE OF BIODIVERSITY

Everyone knows that biodiversity is extremely valuable. The very functioning of the ecosystem is based on maintenance of biodiversity. But to put an economic value on biodiversity is very complex and complicated. Biodiversity is not a commodity but a resource. Even so, it has become necessary to

put a price tag on biodiversity to justify its conservation. For practical purposes, values of biodiversity are divided into:

1. Use Values: Direct use values are for goods that are consumed directly, such as food, fuel or timber, paper, textiles, railway sleepers, leather, pearls and medicines (Penicillin, Tetracycline, quinine).

2. Indirect use values: These are for those services that sustain the items that are consumed, like ecosystem functions like nutrient cycling, carbon cycle, hydrological cycle, pollination etc. The spiritual, cultural, and aesthetic values are also indirect use value of biodiversity. Many plants in India are considered sacred and are used in social and religious functions.

3. Non-use values: There are many less tangible values of biodiversity that are sometimes referred to as non-use or passive values. These are for things that we don't use but would consider as a loss if they were to disappear. Such non-use values are subdivided into three values. These include:

(a) Existence values refer to things that have a value simply because they exist even if one will never use it or see it.

(b) Bequest values, the value of knowing something will be there for future generations.

(c) Potential or Option value refers to the use that something may have in the future.

5. WORTH OF ECOSYSTEM SERVICES GLOBALLY

According to IUCN, the World Conservation Union, "the monetary value of goods and services provided by ecosystems is estimated to be around US\$33 trillion per year. Meat from wild animals is a food source and livelihood option in many countries, especially those with high levels of poverty and food insecurity. Nearly 100 million metric tonnes of aquatic life, including fish, mollusks and crustaceans are taken from the wild every year". This ensures food security and hunger alleviation. NATURE PROVIDES ALL THESE FREE OF CHARGE.

6. ECOLOGY

Strong foundations in ecology describing the principles and interactions of organisms and the environment are required for understanding of ecosystem services. For example, in a forest, the soil quality will itself depend upon the functional microbes, the leaf litter, precipitation and so on. Even studied alone, the soil quality will determine ecosystem services such as sediment control, carbon sequestering, biodiversity level, to other areas within the watershed. The interactions in Earth's ecosystem and sheer complexity poses a challenge to ecologists to in their understanding the linkages among organisms, processes and their surroundings. In the natural world it's quite possible that benefits come in a cluster. Along with the targeted benefit, other benefits may also come. The same forest providing sediment control may also provide shelter for wildlife and provide aesthetic value which are also ecosystem services.

The study of ecosystem services relating to humans includes:

- Identifying ecosystem service providers (ESPs) – Identifying roles and relationships of species or populations that provide particular ecosystem services;
- Identifying human aspects that determine how ESPs function in their natural landscape;
- Assessment of abiotic factors influencing the provision of services;

In order to formalize the ESP functionality a technique has been developed to measure the relative importance of different species in terms of their contribution and presence.[5] They provide information on the response of species to the changes in the environment. This helps to identify relative importance

of species in providing ecosystem services. What is not captured are the effects of interactions, that are often both complex and important in maintaining an ecosystem. This may exclude species do not appear to be important. Yet it helps in estimating the resilience of a system when faced with change.

Enhancing biodiversity can help the variety of ecosystem services available to society. In the management of natural resources and ecosystem services, the interaction of biodiversity with ecosystem stability needs to be recognized. Otherwise, decisions can be taken which entail loss of biodiversity with consequent decline in ecosystem services. The bio-diversity of a country is its sovereign property. It is a vital resource upon which nations, communities, families, and future generations depend. It is a link tying all organisms on earth into an interdependent ecosystem where every species has a role. It is indeed the very web of life.

Local people possess immense knowledge about the traits that these bio-resources contain. These traits may be of medicinal, nutritional, aesthetic, spiritual, social, or many other utilitarian values. Tribal and forest dwelling communities in India are the custodians of this biological wealth. India is also rich in traditional and indigenous knowledge, both recorded and informal. As per the Convention on Biological Diversity (CBD) to which India is a signatory, any commercial gain arising out of such resources by a person/agency/country other than the locals (who have the knowledge and have conserved the resource since time immemorial) should share the benefits equitably with the people who conserve. In order to protect the interests (rights) of such people it is essential to document their knowledge of the local biodiversity and their use. Community registers are one way of recording this knowledge at the grass root level. The role that women play for example in conserving traditional seeds and cultivars can be recorded. The Panchayati Raj Institutions with mandatory 1/3rd reservation for women can be actively involved in this process of recording and safe keeping.

The role of women in biodiversity conservation has been a neglected area even when women have immense knowledge of plants and animals in their immediate environment. Infact the basis for women's life is the environment with its natural resources. Traditionally women are seed collectors and preservers. They interact closely with a variety of indigenous plants, trees and animals and have a direct stake in their preservation. Bio-diversity loss affects the most marginalized people, women being the worst affected. Their problems, and those of the environment, are intricately correlated. Despite possessing immense ecological knowledge, women have to exploit natural resources many times for survival.

In strengthening the role of women in biodiversity, the role of agricultural, rural and women's universities cannot be undermined. Gender sensitization and focus on women multiple roles can bring into prominence the women's role in agriculture, forestry and allied activities. The home science colleges especially in those parts of the country that are centers of rich bio-diversity should conduct courses that incorporate and highlight the unique flora of the area. The connections between flora, fauna and conservation ethics can be promoted. There are different hypothesis regarding ecosystem services. To understand services rendered by species, the following hypothesis will be useful:

6.1 Redundancy Hypothesis

When more than one species perform similar roles, the decline in one species increases stress to other species making the system more susceptible to disturbances.

6.2. Rivet Hypothesis

Another idea uses the analogy of rivets in an airplane wing, where losing each rivet one by one makes the aircraft to crash. Similarly, loss of one species may not affect the ecosystem considerably. But when more and more species are lost, the system eventually collapses. Each species have specialized roles. Therefore, their ability to compensate for each another is far too less than in the redundancy hypothesis. That is why the loss of even one species becomes more damaging.

6.3 Portfolio Effect

Biodiversity is compared to a bunch of investment portfolio, where diversification minimizes the risk of the investment. Since different species will respond differently to a given environmental disturbance, they create a stabilizing effect when bundled together. Thus, biodiversity preserves the integrity of a service [6].

7. ECONOMICS

Economists are realizing the importance of ecosystem services. Environment education is steadily improving but understanding of the ecosystem capital and its flow is still lacking. It is not easy to translate scientific ecological understanding to economics to enlighten policy makers. The exact benefits to human well-being by preserving nature is difficult to quantify in monetary terms. Knowing the interactions of ecological processes in ecosystem services is essential while taking economic decisions.[7].

There are different methods for valuing ecosystem services in monetary terms which are as follows:

7.1 Avoided cost

Many services allow society to avoid costs that would have been incurred in the absence of those services. Shelter belts and greenery in cities can avoid health costs due to pollution.

7.2 Replacement cost

Some services can be replaced with human-made systems. Solid waste management can cost less than managing garbage dumps.

7.3 Factor income

Some services can increase incomes. Restoration of groundwater can increase income of farmers.

7.4 Travel cost

Some services require travel. Willingness to pay can help value such services.

7.5 Hedonic pricing

Services may be valued by the prices people are willing to pay for associated goods. Homes facing a lake may demand more price than similar homes in cities.

7.6 Contingent valuation

What customers are willing to pay for contingent additional services? Tourists willing to pay for increased visits inside a nature reserve.

8. MANAGEMENT AND POLICY

Valuing ecosystem services is a challenge to policy makers. They have to balance present and future needs and work with incomplete information. Existing policies and laws are too human centric and based on human health-based standards that are not in sync with protecting ecosystem health and services. Implementation of an Ecosystem Services Framework (ESF [8]), is suggested to enhance the available information.

One solution that is being used is to acquire credits for sponsoring protection of environment. Another solution is to protect biodiversity hotspots by prioritizing sites and species. Efforts are on to integrate ecosystem services into public and private policy making. Payments for ecosystem services (PES) initiatives takes into account the provision of ecosystem services by private suppliers. Other examples include World Bank's Wealth Accounting and Valuation of Ecosystem Services (WAVES) program and The Economics of Ecosystems and Biodiversity (TEEB) project.

9. SCENARIO IN INDIA

The impact of current global economic changes in India is the decline of biodiversity at all levels. Since biodiversity is the base for human life support systems, their loss has negative impacts for humanity. In India dependence on forest foods and forests as providers of famine food is very significant for livelihoods of marginalized communities. Ecosystem services are mostly grossly undervalued by society due to ignorance and apathy. The causes for loss of biodiversity and ecosystem function damage because of wrong production and consumption patterns are far too many to mention. In India, usually the loss is due to not local actions but implementation of decisions by those not directly affected by such policies. Wrong type of subsidies, weak implementation of regulations, corruption, lack of political will, lack of capacity and inadequate information and knowledge, all lead to erosion of natural resource base. Indian farmers have maintained genetic diversity. Genetic diversity differentiates breeds or races from each other. This provides the basis for developing cultivars well-adapted to local conditions. This genetic pool furthers the cultivation of commercial crops and livestock. Some habitats have an exceptionally high number of biodiversity than others and are labelled as 'biodiversity hotspots'. Unfortunately, some modern uniform agricultural practices have eroded the genetic diversity in crops that is essential to develop new strains of cultivars.

10. SUMMARY

Ecosystems and presence of biodiversity contained within them are providing many goods and services to humanity. Only with sustainable use can we assure a continuous provision of such goods and services. The loss of even a single species is an indicator of ecosystem degradation. Overtime such a loss has significant consequences for humanity. India which is one of the most richest biodiversity centre in the world is experiencing severe consequences of ecosystem degradation both in urban and rural areas. It is affecting a large percentage of our population which is directly dependent on nature and natural resources for income and living. The causes of ecosystem degradation are far too many and often interlinked. Even as markets fail to capture ecosystem degradation, economic policies frequently provide negative incentives that erode the biodiversity base. In the absence of clear environmental policy objectives, widespread corruption, poor enforcement of existing rules and laws, lack of institutional capacity, absence of secure property rights, lack of political will lead to ecosystem degradation. Moreover, our limited capacity to deal with the potentially hazardous results of ecosystem degradation is increased due to not understanding ecosystem functioning and the benefits thereof to the society at large.

Knowledge about value of ecosystem services will not in itself prevent ecosystem degradation. The knowledge has to be used to redress market and policy failures. Negative incentives that lead to degradation have to be scrapped. Instead positive incentives should be provided for achieving sustainable outcomes by a system of payments for ecosystem services.

11. CONCLUSIONS

Ecosystems anywhere have value since they provide goods and services. Such ecosystem services include the purification and generation of air, soil and water, the pollination of crops, sediment control, nutrient cycling, and waste disposal, moderating climate, flood and drought control. For each ecosystem like forests, wetlands, grasslands, mountains and hills, rivers and seas, the value of ecosystem goods and services has to be spelt out.

Ecological literature has pointed to the complexity of ecosystem functioning and its response to several human pressures. So far, land management decisions have only taken a small subset of ecosystem consequences, and that too usually only at local levels. The full range of ecosystem services has rarely been considered. Ecological science has been able to unravel many complexities of ecosystem functioning and consequences. Quantification of these has remained a challenge.

REFERENCES

1. Millennium Ecosystem Assessment (MEA). 2005. Ecosystems and Human Well-Being: Synthesis. Island Press, Washington. 155pp.
2. Hanson, C, J Ranganathan, C Iceland, and J Finisdore. (2008) The Corporate Ecosystem Services Review (Version 1.0). World Resources Institute. <http://www.wri.org/project/ecosystem-services-review>
3. <http://esd.uvm.edu/>
4. <http://www.naturalvalueinitiative.org/>
5. Balvanera, P. C. Kremen, and M. Martinez. 2005. Applying community structure analysis to ecosystem function: examples from pollination and carbon storage. *Ecological Applications* 15: 360-375.
6. Elmqvist, T., C. Folke, M. Nyström, G. Peterson, J. Bengtsson, B. Walker and J. Norberg. 2003. Response diversity, ecosystem change and resilience. *Frontiers in Ecology and the Environment* 1: 488-494.
7. DeFries, R.S., J.A. Foley, and G.P. Asner. 2004. Land-use choices: balancing human needs and ecosystem function. *Frontiers in Ecology and the Environment* 2: 249-257.
8. Daily, G.C. 2000. Management objectives for the protection of ecosystem services. *Environmental Science & Policy* 3: 333-339.