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"Biodiversity and Sustainable Development: A Critical Analysis"

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Abstract Solving the problem of environmental threats and a dwindling biodiversity has been on the international agenda for some decades now. The formulation of environmental questions, however, is changing slowly People have made unprecedented changes to ecosystems in recent decades to meet growing demand for food, fresh water, fibre and energy. The quality of life for billions of people has improved, but these changes have weakened nature's ability to deliver key services. In this paper, I have tried to analyze how the changes to natural ecosystems influence both climate change and people's ability to cope with some of its damaging impacts. And in their turn climate change, as well as people's responses to it, affect biodiversity.

Index Terms: Environment, Biodiversity, Sustainable Development, Eco-System, Pollution, Conservation and Policy

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"Failure to conserve and use biological diversity in a sustainable manner would result in degrading environments, new and more rampant illnesses, deepening poverty and a continued pattern of inequitable and untenable growth."

-Kofi Annan

Introduction:

A good environmental sense has been one of the fundamental features of India's ancient philosophy. The civilisation of India has grown up in close association with the nature. There has always been a compassionate concern for every form of life in the Indian mind. This concern is projected through the doctrine of Dharma.[1]The cosmic vision of earth is based on the concept of *'Vasudev Kutumbakam'*. The way forward will require a turn towards restoration and renewal.

Human societies have always relied on biological resources for physical and spiritual sustenance. Biodiversity ultimately provides us with a source of food, medicines, materials and opportunities. The earth's biological resources are vital to humanity's economic and social development. As a result, there is a growing recognition that biological diversity is a global asset of tremendous value to present and future generations. At the same time, the threat to species and ecosystems has never been as great as it is today. Species extinction caused by human activities continues at an alarming rate,[2]

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[1] Arvind Jasrotia, Environmental Protection and Sustainable Development: Exploring the Dynamics of Ethics and Law, Journal of the Indian Law Institute,Vol.49 , p.34

[2] S.R.Myneni,Law of Intellectual Property', 5th Edn, (Asia Law House, Hyderabad, 2009 ,)P.N.536

reduction of the earth's biodiversity as a result of human activities is a matter of great concern.[3]

Human activities motivated by the attitude of rampant consumerism and unsustainable patterns of production and consumption have never been so inhumane and callous towards environment as in the modern era of scientific and technological innovations. Man's greed attacks nature environment and ecology and wounded nature backlashes on the human future.[4] We are in the midst of the sixth era of extinction. This problem can be solved only by proper guidance, awareness, education, transfer of advance technology, research, conservation and sustainable use of biological diversity. In order to highlight the importance of biodiversity, 2010 has been selected as the *International Year of Biodiversity* in an attempt to educate people on biodiversity and how biodiversity supports everyday life.[5]

Meaning of Biodiversity

Biodiversity is the variety of life forms we see around us. It encompasses the whole range of mammals, birds, reptiles, amphibians, fish, insects and other invertebrates, plants, fungi and micro-organisms such as protists, bacteria and viruses. It includes the genetic and morphological variability within a species and the assemblages of plants, animals and micro-organisms which together form their ecosystems and natural habitats. Article 2 of the Biodiversity Convention defines biological diversity to mean: The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.'

To some, the term is aligned with the idea of conserving the unique flora and fauna of ecosystems under threat, which are considered as legacy to human society. To others, especially the poor, biodiversity refers to the assortment of living organisms serving as food, medicine, and shelter to both humans and other living organisms, and providing the ecosystem with the services and other uses that human society needs to survive and develop now and in the future. Those with the technology can transform biodiversity into big business! Biodiversity obviously has different meanings and values at various levels (local versus global), and among various stakeholders (policymakers versus local resource users versus the scientific community).

On the eco-system dimension of bio-diversity there is already a high degradation. In history there were many natural extinction of species, but the current rates of extinction are estimated to be roughly 100- times higher than typical rates in the fossil record. There are estimations that the increase will be 1000- 10,000 times higher in the future. Quantifying loss of genetic diversity is difficult, but it is clear that

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[3]Papers.ssrn.com/sol3/papers.cfm? abstract-id=355141

[4] V.R.Krishna Iyer , "The Dialectics and Dynamics of Human Rights in India", 1999, P.7

[5] www.suite101.com/content/the-importance- of -diversity-a214198

the extinction of species and declines of population lead to a loss of genetic diversity.[6]

Sustainable Development

Sustainable development, according to the Brundtland Report of 1987, is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Put in the new globalised order, sustainable development is the integration of economic, social and environmental development considered as the inter-dependent and mutually reinforcing pillars which operate at the local, national, regional and global levels. This sets out two fundamental principles of intergenerational and intragenerational equity.

The principle of Intergenerational equity means need to preserve natural resource for the benefit of future generations. The principle of Intragenerational equity means equitable use of natural resources which implies that use by one state must take in to account of the needs of other states. We have to recognise our own limits in claiming the fruits of the earth and in managing and manipulating nature.

Poverty eradication, the change in unsustainable patterns of production and consumption, and the protection and management of natural resources base of economic and social development, are constantly cited as the over-arching objectives and essential requirements for sustainable development.

Interrelation of Biodiversity and sustainable Development

In the sustainability framework discussed earlier, biodiversity is a key feature or element of the natural resource base which, when it interacts with the technology and socioeconomic dimensions, determines the pathway of development. If the existing technological, socioeconomic and institutional processes erode biodiversity and its functional elements as a component of the natural resource base, the resulting development process will not be sustainable in the long run. However, if biodiversity is well-managed such that its structure and functional relations are kept intact, then a more sustainable pathway for economic development could likely be attained.

Biodiversity, literally, is the foundation upon which human civilization has been built. In addition to its intrinsic value, biodiversity provides goods and services that underpin sustainable development in many important ways, thus contributing to poverty alleviation. First it supports the ecosystem functions essential for life on Earth, such as the provision of fresh water, soil conservation, and climate stability. Second, it provides products such as food, medicines and materials for industry. Finally, biodiversity is at the heart of many

[6]www.czp.cuni.cz/vcsewiki/index.php/Loss_of_Biodiversity_caused_and_solved_by_Globalisation%3F

cultural values. In total, biodiversity is life insurance for sustainable development.[7]

In the message to the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa, the UN Secretary General introduced the WEHAB initiative which recognized water, energy, health, agriculture and biodiversity as the basic necessity for life. Sustainable development will result from the interactions of three major and interacting elements: (a) technology; (b) natural resource base; and (c) socioeconomic elements. To attain sustainable development, these three major elements must work in a symbiotic and complementary manner so that the goods and services generated by the interactions of technology and the resource base which are needed by human society are produced sustainably. Technologies that must be developed or used to utilize the natural resource base must not only be economically viable but also be environmentally-friendly.

Causes of Biodiversity Loss

Habitat destruction, overexploitation, pollution, and species introduction are the major causes of biodiversity loss in India. Other factors included fires, which adversely affect regeneration in some cases, and such natural calamities as droughts, diseases, cyclones, and floods. Habitat destruction, decimation of species, and the fragmentation of large contiguous populations into isolated, small, and scattered ones has rendered them increasingly vulnerable to inbreeding depression, high infant mortality, and susceptibility to environmental stochasticity and, in the long run, possibly to extinction. Besides these, the failure to stem this tide of destruction results from an amalgamation of lacunae in economic, policy, institutional, and governance systems. Among others, these include management with limited local community participation and involvement and inadequate implementation of eco development programmes; poor implementation of the Wildlife (Protection) Act of 1972 as amended in 1991. Biodiversity conservation in India is also impeded by a lack of knowledge of the magnitude, patterns, causes, and rates of deforestation and biodiversity loss at the ecosystem and landscape level. Poaching and trade in wildlife species are among the most important concerns in the management of protected areas today but information on poaching, trade, and trade routes is sketchy and current wildlife protection and law enforcement measures are inadequate and inefficient.[8]

Major threats to Biodiversity while non-recognition of the importance of biodiversity remain the principal and overriding threat to conservation initiatives, the following are agreed to be the major threats to biodiversity:

- Uncontrolled commercial exploitation of natural resources,

[7] Alfred A. Oteng-Yeboah (Prof.), CSIR-Ghana, P.O. Box M32 Accra Ghana, Biodiversity and SustainableDevelopment, www.bgci.org/barcelona04/postcongress/Plenary/OtengYeboah.DOC

[8] http://moef.nic.in/soer/2001/ind_bio.pdf

- Habitat destruction, including destruction of forests, reclamation of wetlands etc,
- *Adhoc* extension of high input agriculture,
- Conversion of rich biodiversity sites for human settlement and industrial development,
- Destruction of coastal areas.[9]

Need for Conservation of Bio diversity

Biodiversity conservation is unlike any other sustainable development issue because loss of biodiversity is irreversible. Extinction is final and there is no second chance. Earth's resources are finite and there are ecological limits to growth which, unless we alter our ways , will sooner rather than later be exhausted.[10]

Although the question may seem like heresy to an ecologist, we cannot take it for granted that all sectors of society see value in biodiversity. Quite the contrary, humans often deliberately reduce biodiversity to achieve their goals. In many parts of the globe fields of richly varied plant types have been replaced by vast uniform fields of maize, wheat, and other valued crops. Some of these commercial monocultures are even monoclonal, the ultimate in low diversity. Programs of pest control, both agricultural and residential, strive to eliminate unwanted creatures with no concern for the resulting impact on biodiversity. Although it is difficult to exterminate "pests" in the sea, it has certainly been tried – many countries have sought to cull seals and other marine predators that compete with man.

It is useful and indeed necessary to remind ourselves that a healthy human environment depends entirely on biodiversity. Everything we eat, wear and produce on this planet Earth is ultimately dependent on its biodiversity. Indeed, there is little awareness in most urbanized societies that the food on the table is a product stemming from biological diversity. This lack of awareness compounds the problem that ever-increasing demands on the world's resources to satisfy the needs of modern life are leading to overuse of biological diversity. Arguably, then, the greatest challenge facing humanity is to either curb unrealistic expectations and bring over-used resources back to sustainable limits, or find alternatives for these resources. Failure to conserve and use biological diversity in a sustainable manner would result in degrading environments, new and more rampant illnesses, deepening poverty and a continued pattern of inequitable and untenable growth.

Humans, however, seem to have forgotten the importance of biodiversity, and continued to exploit other life forms for their selfish gains. Increasing population has resulted in rapid growth in consumption of resources, which has in turn resulted in loss on biodiversity on the planet. Over the last few decades, biodiversity importance has become one of the top priority environmental issues for the United Nations, and this very fact has pushed them to come up with measures like the 'International

[9] http://www.environment.tn.nic.in/SoE/images/biodiversity.pdf
[10] Supra Note 1

Year of Biodiversity' in order to save the environment[11].

Consequences of extinction of Biodiversity

While there is considerable debate over the scale at which biodiversity extinction is occurring, there is little doubt we are presently in an age where species loss is well above the established biological norm. Extinction has certainly occurred in the past, and in fact, it is the fate of all species, but today the rate appears to be at least 100 times the background rate of one species per million per year and may be headed towards a magnitude thousands of times greater.

First, we can attribute the loss of species and ecosystems to the accelerating transformation of the earth by a growing human population. As the human population passes the six billion mark, we have transformed, degraded or destroyed roughly half of the world's forests. Most extinctions over past several hundred years are mainly due to over-harvesting for food, fashion, and profit. Commercial hunting, both legal and illegal (poaching), is the principal threat.[12]

Ex-tinctions can disrupt vital ecological processes such as pollination and seed dispersal, leading to cascading losses, ecosystem collapse, and a higher extinction rate overall. The new study, headed by a biologist at the University of California, Santa Barbara (UCSB), found that species extinction will reduce nature's ability to maintain ecological balance and "services" such as water filtration, nutrient cycling, and pollination. [13]

Existing Policy Responses

There are so many International as well as national legislations relating to conservation and sustainable use of the natural resources. Some of them are discussed below.

- **The Convention on Biological Diversity**

The Convention on Biological Diversity (CBD) is a landmark in the environment and development field, as it takes for the first time a comprehensive rather than a sectoral approach to the conservation of Earth's biodiversity and sustainable use of biological resources. It was in the year 1984 that the need to have in place a global convention on biological diversity started gaining momentum. In response, the United Nations Environment Programme (UNEP) in the year 1987 recognised the need to streamline international efforts to protect biodiversity. The Convention on Biological Diversity (CBD) was negotiated and signed by nations at the UNCED Earth Summit at Rio de Janeiro in Brazil in June 1992. The Convention came into force on December 29,1993. India became a Party to the Convention in 1994. At present, there are 175 Parties to this Convention. The CBD acknowledges sustainable resource management as a basic means of addressing conservation and

[11] http://www.buzzle.com/articles/importance-of-biodiversity.html

[12] http://www.globalchange.umich.edu/globalchange2/current/lectures/biodiversity/biodiversity.html

[13] http://news.mongabay.com/2006/1025-biodiv.html

economic issues, within the context of the full spectrum of biological resources: fisheries, forests, agriculture, wild plants and animals as well as the genetic material derived from them.

The main objectives of the Convention are :

- Conservation of biological diversity;
- Sustainable use of the components of biodiversity;
- Fair and equitable sharing of benefits arising out of the utilisation of genetic resources.

Ten years have passed since the CBD entered into force. Ten years of intense negotiations and hard work by Parties, Secretariat and civil society have translated the text of the CBD into more concrete and 'workable' instruments such as work programmes and the Cartagena Protocol. Nevertheless, biodiversity, the very basis of life, is today still being lost at high speed and the implementation of the CBD remains difficult. The broad scope and overarching nature of the CBD as well as limited political support for its implementation, make existing instruments neither enough known nor used.

- **Wild Life Protection Act**

Wild Life Protection Act is in the final stage of revision and provisions have been made for conservation reserves and community reserves to allow restrictive use to make it more people oriented. Presently Biodiversity Act which is in the final stage, has got the component of National Biodiversity Authority to control access to genetic resources form international community. There will also be State Biodiversity Boards to control access to domestic consumers.

- **Biological Diversity Act, 2002**

After an extensive and intensive consultation process involving the stakeholders, the Central Government has brought Biological Diversity Act,2002 with the following salient features:-

- to regulate access to biological resources of the country with the purpose of securing equitable share in benefits arising out of the use of biological resources; and associated knowledge relating to biological resources;
- to conserve and sustainably use biological diversity;
- to respect and protect knowledge of local communities related to biodiversity;
- to secure sharing of benefits with local people as conservers of biological resources and holders of knowledge and information relating to the use of biological resources;
- conservation and development of areas of importance from the standpoint of biological diversity by declaring them as biological diversity heritage sites;
- protection and rehabilitation of threatened species and to involve institutions of state governments in the broad scheme of the implementation of the Biological Diversity Act through constitution of committees.[14]

- **Constitutional provisions**

The Indian Constitution is among few in the world that contains specific provisions on environmental protection .The Directive

[14] http://www.nbaindia.org/introduction.htm

Principles of State Policy and fundamental duties chapters expressly enunciate the national commitment to protect and improve the environment.[15] Judicial interpretation has strengthened the constitutional mandate. Though part III of the Constitution does not contain any provision to provide right to pollution free environment as a fundamental right, but in view of the liberal interpretation given to article 21 coupled with articles 48-A and 51-A(g), the Supreme Court interpreted the right life and personal liberty to include the right to wholesome environment.

Policy Gaps

- Lack of policies for protection of wetlands, grasslands, sacred grooves and other areas significant from the point of view of biodiversity.
- Lacunae in economic policy, institutional and governance system.
- Inadequate enforcement of existing laws.
- Poor implementation of wildlife protection act 1972 as amended in 1991
- Inadequate implementation of eco-development programmes.
- Need for enhanced role of NGOs and other institutions.
- Need for political commitment and good will.
- Need for providing Institutional Structure.
- Need for more sectoral financial outlay.
- Human resource development – limited local community participation.

Policy Recommendations

- Most of the legal provisions pertain mainly to use/exploitation of biological resources, rather than their conservation. Even Wild Life Protection Act 1972, focuses on protection rather than conservation. Protection under Wild Life Protection Act is largely directed towards large animal species (charismatic terrestrial species) rather than the large spectrum of fauna and flora also found in the marine realm.
- Hence the existing laws relating to biodiversity shall be examined in order to bring them in tune with the provisions of convention to reflect current understanding of biodiversity conservation. There is a need for comprehensive legislation on biodiversity conservation and use especially fisheries policies, which is generally ignored.
- Formulation of policies for protection of wetlands, grasslands, sacred groves, marine flora and fauna and other areas is significant from the point of view of biodiversity.
- Documentation of biodiversity.
- Increase allocation of financial resources for conservation of biodiversity.
- Integrating conservation with development.

[15] Article 48-a and Article51-A(g) of the constitution of India.

There should be continuous monitoring of biodiversity use for review of results of implementation of policies and programmes.

Information about the Bio-Diversity

- Documentation of biodiversity is an urgent requirement as latest statistics and data on floral and faunal biodiversity of India has not been compiled and documented.
- The information and data should be made available to the scientific and socio-economic agencies to support the evaluation revision of the policies.
- Lack of knowledge of the magnitude, patterns, causes and rates of deforestation and biodiversity laws at the ecosystem and landscape level, information on poaching trade and trade routes is sketchy and current wildlife protection and law enforcement measures are inadequate and inefficient procedure.
- Biodiversity Act should not override the provisions of Wildlife Protection Act.

Conclusion

This is a critical moment in earth's history, a time when humanity must choose its future. Our planet earth is perhaps the only human habitat in the vast universe and we owe it to posterity to preserve the divine heritage of our biosphere without pollution, degradation and destruction.

The long term perspective for sustainable development requires the broad-based participation of various stakeholders in policy formulation, decision-making and implementation at all levels in particular of issues of biological diversity and this must be encouraged. While progress towards sustainable development has been made through meetings, agreements and changes in environmental governance, real change has been slow. To effectively address environmental problems, policy-makers should design policies that tackle both pressures and the drivers behind them. Economic instruments such as market creation and charge systems may be used to help spur environmentally sustainable behaviour.