Environmental Governance for Ecosystem Management to Achieve Sustainability Must be Effective in Indian Situations

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Abstract—*Good governance in relation to environmental management involving commitments to global treaties, transparency and accountability, sensitive ecosystems, conservation projects, water resource management, climate change mitigation approaches, research, education and training capacity building is essential to be effective for better action plan. Ecological systems are complex mix of several attributes and components. The implementation of environmental policy in India faces a variety of difficulties at the state level. There is need to understand the role of environmental governance in the context of sustainable development at three levels i.e. engaging with multiple viewpoints and outcomes; observing sustainability rules; embracing knowledge as a supplement to science and technology in environmental policy making and regimes.*

Keywords*: Governance, ecosystem management, policy, sustainability, decision making.*

1. INTRODUCTION

Sustainability must see three components viz. environment, economic and social. India has made one of the fastest progresses in the world, in addressing its environmental issues and improving its environmental quality [1-2]; and population density may not be the only factor affecting India's issues [3]. Major environmental issues are forest and agricultural degradation of land, resource depletion (water, mineral, forest, sand, rocks etc.), environmental degradation, public health, loss of biodiversity, loss of resilience in ecosystems, livelihood security for the poor [4]. The major sources of pollution in India include the rampant burning of fuelwood and biomass such as dried waste from livestock as the primary source of energy [5], lack of organized garbage and waste removal services, lack of sewage treatment operations, lack of flood control and monsoon water drainage system, diversion of consumer waste into rivers, cremation practices near major rivers, government mandated protection of highly polluting old public transport, and continued operation by Indian government of government owned, high emission plants built between 1950 to 1980 [6-10].

The Yokohama World Conference on Natural Disaster Reduction (1994), a mid-term review of the International Decade for Natural Disaster Reduction, placed greater emphasis on the role of social sciences in research, policy development and implementation and emphasized the links between disaster reduction and sustainable development [11]. The impact of climate change on increased frequency and intensity of disasters has led to wider movements of populations to safer areas [12]. Disaster reduction can take place at any point in the process which we call disaster. It can comprise prevention and preparedness, relief and development as well as measures to reduce the effects of such disasters [13]. The Hyogo Framework for Action, although not a binding international instrument, does affirm the duty of states to try to reduce the risk of disasters [14].

It is characterized by a non-adversarial approach, the participation of *amicus curiae*, the appointment of expert and monitoring committees by the court, and the issue of detailed interim orders in the form of continuous mandamus under Articles 32 and 226 by the Supreme Court of India and the High Courts of the States respectively. In *M.K. Sharma* v. *Bharat Electric Employees Union*, the Court directed the Bharat Electric Company to comply with safety rules strictly to prevent hardship to the employees ensuing from harmful X-ray radiation. The Court did so under the ambit of Article 21, justifying the specific order on the reason that the radiation affected the life and liberty of the employees. Safeguard of environment with respect to the "public interest" on the basis of "rational" and scientific tools are more important [15]. Effective environmental governance is helpful in achieving Sustainable development (sustainability) for natural resources [16] and ecosystems.

2. NATURAL RESOURCES OF INDIA

India has 48% arable land, 22% area as forest and total renewable water resources accounts about 1,907.8 km3/year. Many fertile soils including alluvial soil which comprises 80%

of the total fertile soil is available. India occupies a prominent place in the world in the production of many minerals. The chief minerals include Coal, iron ore, manganese, mica, bauxite, titanium ore, chromite, diamonds, limestone, thorium, petroleum, natural gas. India makes use of both renewable and non renewable energy resources; energy resources include natural gas, thermal, hydro, nuclear and other renewable sources. India has diverse vegetation which includes tropical rainforests, deciduous forests and coniferous forests.

India has 6 % of the world's flowering plants. India has many species of animals, birds and reptiles which includes 7.6% of all mammalian, 12.6% of avian, 6.2% of reptilian of the wildlife population in the world Asian Elephant, Bengal Tiger, Asiatic Lion, Leopard, Sloth Bear and Indian Rhinoceros, antelopes are some of the important animals.

3. NATURAL RESOURCES PROBLEMS

Resources are depleting every day. Forest and arable land is being depleted due to urbanization, overpopulation and overconsumption; Wild life resources are being lost due to illegal poaching, hunting and industrialization. Water iresources are being contaminated are drying up due to industrialization. Unsustainable resources use and not adopting eco-friendly energy sources leads to climate change which in turn have impacts on all the components of ecosystems. There are threats to Natural Resources due to urbanization and industrialization, overpopulation, overconsumption and irresponsible use, deforestation, erosion, habitat destruction, natural hazards improper access to resources such as water.

4. ENVIRONMENTAL LAW

Sustainable development can be achieved through enforcement of effective environmental law for environment management. The Water (Prevention and Control of Pollution) Act of 1974 gave the statute book its first real foundation for environmental protection. Then the Forest (Conservation) Act 1980, The Air (Prevention and Control of Pollution) Act 1981, and The Environment (Protection) Act 1986 came for environmental protection. In *Rural Litigation and Entitlement Kendra* v. *State of Uttar Pradesh*, the Supreme Court based its comprehensive interim orders on the judicial understanding that environmental rights were to be implied into the scope of Article 21. Beginning with *Vellore Citizens' Welfare Forum* v. *Union of India*, the Supreme Court has explicitly recognized the precautionary principle as a principle of Indian environmental law.

In *A.P. Pollution Control Board* v. *M.V. Nayudu*, the Court discussed the development of the precautionary principle. The power under Article 32 to award damages, or even exemplary damages to compensate environmental harm would not extend to the levy of a pollution fine. The "polluter pays" rule has also been recognized as a fundamental objective of government policy to prevent and control pollution. Sustainable development means that the richness of the earth's biodiversity would be conserved for future generations and the answer lies in the decision of the Supreme Court in *Narmada Bachao Andolan* v. *Union of India.* Sustainable development requires a holistic approach. The National Green Tribunal has been established on 18.10.2010 under the National Green Tribunal Act 2010 for effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith or incidental thereto. It is a specialized body equipped with the necessary expertise to handle environmental disputes involving multi-disciplinary issues.

5. GOOD GOVERNANCE STRATEGIES

Government of India must undertake many measures for implementation of action plan for the conservation of resources. Regulations and reforms for proper housing and infrastructure development to avoid land acquisition problems, mass media public service messages to educate the people on the importance of conservation of resources, increase the wildlife and forest reserves in the country, schemes to do a proper inventory of the resources and monitor changes in the environment, various projects and schemes that promote conservation of resources and many other approaches for sustainability. India recognizes the need to adopt a sustainable growth model. Ground verification forms an important and integral part of visual interpretation process of remotely sensed data. Ground data is attributed to collection / verification and measurement of information about different surface features, which are responsible for reflectance behavior patterns.

There is need to cultivate and promote water resource development and equitable distribution through various methods, including rainwater harvesting, farm ponds, conservation of natural springs, contour trenching, and lift irrigation; convert eroded, barren land into productive orchards using various eco-friendly practices such as the use of bio-fertilizers, green manure, vermin-compost, and bio-pesticides; conduct research on and analyze water harvesting/management systems, vegetative and animal biodiversity, renewable technology integration, crop improvements, creating new markets for farmers, etc; organize and strengthen village-level/ local level awareness groups, implement campaigns on natural resource management and biodiversity, provide capacity-building initiatives for community leaders, and identify and preserve vegetative and animal biodiversity; train local communities on the proper use and maintenance of renewable technologies, organic farming methods, and/or forest management; carry out impact assessments, and monitor and evaluate water/natural resource management, sustainable agriculture methods, renewable technology implementation, etc.

6. ACHIEVING SUSTAINABILITY

Developmental activities with respect to ecosystem management for sustainable development require eco-friendly and ecologically bearable, economically viable and socially acceptable fitting within cultural values and ethics. All negative feedback elements in ecosystems may leads to sustainability and some simple but very effective tips like switch off lights and fans etc when not in use, use both sides of paper, grow more trees (forest development), use cycle for short distances and prefer public transport for long travels, use always dustbins for litter/ segregate wastes, use minimum water for various purposes, carry cloth/ jute bag for market, switch to non-conventional energy source e.g. solar, avoid all types of pollution to save life & ecosystem, IEC/ educate people etc can leads to sustainable development.

7. CONCLUSION

The poor people and community members are more vulnerable to the loss of resilience in ecosystems. There is need for a greater policy harmonization and coordination across and between levels of government but also across sectors and agents. Environmental governance requires a stronger interaction among state and non-state actors; strengthening major groups' involvement. Effective environmental policy involving innovative techniques like EIA for projects' implementation, adopting 5-R concept (renew, reduce, refuse, recycle, reuse) etc must be preferred in ecosystem management for achieving sustainability. Environmental decision-making and debates although emanating from a multi-layered structure, often reflect the concerns that are perceived as important by the urbanized population. Table 1 indicates problems and their solutions associated with natural resources. Sustainable development considers future and present needs when making decisions about resource and energy use, technological development, direction of investments, social, political & institutional change with protection of environment.

Table 1: Some strategies for achieving sustainability for ecosystems.

Problems	Solutions
Overpopulation	Develop population control measures and educate people on the advantages of a small family
Overconsumption and irresponsible use	Educate people on the importance of conservation of resources using mass media. Develop partnerships with advocacy groups and environmental NGOs for spreading the message
No proper access to resources	Privatization of the some of the resource management function will help in better developing the delivery mechanism
Deforestation and Habitat destruction	Have stringent regulations for the protection of the resources and ensure that the defaulters are punished
Natural Hazards	Develop and employ tools for monitoring the possibility of natural hazards and providing preventive measures

REFERENCES

[1] "The Little Green Data Book". The World Bank. 2010.

[2] "Environment Assessment, Country Data: India". The World Bank. 2011.

[3] Henrik Urdal (July 2005). "People vs. Malthus: Population Pressure, Environmental Degradation, and Armed Conflict Revisited". *Journal of Peace Research* 42 (4): 417–434.

[4] Environmental Issues, Law and Technology - An Indian Perspective. Ramesha Chandrappa and Ravi.D.R, Research India Publication, Delhi, 2009, ISBN 978-81-904362-5-0

[5] Ganguly et al (2001). "INDOOR AIR POLLUTION IN INDIA – A MAJOR ENVIRONMENTAL AND PUBLIC HEALTH CONCERN". Indian Council of Medical Research, New Delhi.

[6] Milind Kandlikar, Gurumurthy Ramachandran (2000). "2000: India: THE CAUSES AND CONSEQUENCES OF PARTICULATE AIR POLLUTION IN URBAN INDIA: A Synthesis of the Science". *Annual Review of Energy and the Environment* 25: 629–684.

[7] "Drowning in a Sea of Garbage". The New York Times. April 22, 2010.

[8] Steve Hamnera et al. (2006). "The role of water use patterns and sewage pollution in incidence of water-borne/enteric diseases along the Ganges river in Varanasi, India". *International Journal of Environmental Health Research* 16 (2): 113–132.

[9] Klement Tockner and Jack A. Stanford (2002). "Riverine flood plains: present state and future trends". *Environmental Conservation* 29: 308–330.

[10] Sushil and Batra (December 2006). "Analysis of fly ash heavy metal content and disposal in three thermal power plants in India". *Fuel* 85 (17-18): 2676–2679.

[11] Environmental Management and the Mitigation of Natural Disasters: A Gender Perspective, Report of the Expert Group Meeting, Ankara, Turkey, 6 – 9 November 2001, United Nations Division for the Advancement of Women (DAW) Inter-Agency Secretariat of the International Strategy for Disaster Reduction (UN/ISDR) p.1

[12] Walter Kalin Report to the Representative of the UN SG on the human rights of the IDPs:"Protection of Internally Displaced persons in Situations of Natural Disaster" - 5 March 2009 p.9.

[13] Dr.S.K.Kapoor, International Law and Human Rights (Central Law Agency, Allahabad 15thEdn, 2004) p.415-416.

[14] Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters, Extract from the final report of the World Conference on Disaster Reduction (A/CONF.206/6).

[15] Fischer, F., *Citizens, Experts and the Environment: The Politics of Local Knowledge*, (2000) p. 6.

[16] Yadav S K . Soil Ecology, APH Publishers, 2007.