CONCEPTUAL CONSERVATIONAL STRATEGIES FOR WILDLIFE BIODIVERSITY

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ABSTRACT

The conservational and management of wildlife biodiversity is an essential component in the natural resources potential. Understanding wildlife biodiversity is beyond the comprehension of our theoretical knowledge about habitat level, community level and trophic level biodiversity and necessitates the need for humane approach in safeguarding the various wildlife fauna existing as endangered categories. The current perspectives of wildlife conservation involve awareness, action plans, environmental laws/policies and protectives measures through projects, natural parks and sanctuaries. Inspite of such measures human activities and the consequent environmental assaults forewarning the impending disasters and wildlife erosion. Hence, it is very much compelling on our part, especially the biologists and environmentalists, to share information and data dissemination through worldwide web and to undertake virtual ecotourism to conserve wildlife biodiversity.

INTRODUCTION

Wildlife is an entity of resource ecology. The biodiversity of wildlife could be flourished only in the natural forest biomes. These banks (forests) of natural wildlife diversity seemed to be in bloom until such time human population intervention through technology boom slammed its bangs. The aftermath and backlash of industrial revolution has been reflected in different dimensions such as environmental pollution degrading the entities, namely, air, water and land; encroachment of wild life habitats for human settlements, rail and road constructions; conversion of forest lands for agricultural cultivation, illegal poaching activities to derive the natural products of commercial value from wild and deforestation activities, etc. The realization of human folly and depredation necessitated the need for the conservation measures to protect both forests and the wild life therein at national and international levels. The establishment of national parks and sanctuaries has become a reality in the latter half of twentieth century. The establishment of Man and Biosphere programme by UNESCO has summarized the various protocols towards protection of forest resources and wildlife biodiversity. Besides the above environmental approaches, research oriented conservation measures were begun since 2000 in the new millennium to give a new look and insight to the biodiversity of wildlife.

UNDERSTANDING BIODIVERSITY

Biodiversity generally refers to the various types of organisms, both plants and animals including microbes. Understanding biodiversity is not merely knowing the names of species, their classification and their taxonomic hierarchies in both plant kingdom and animal kingdom. In fact, biodiversity exists at different levels, viz., habitat level, community level, trophic level and economic level, etc. The habitat level biodiversity implies the various categories of environmental habitats and forest biomes and their ecological characteristics. The community level biodiversity may delineate the species variations, species abundance, species dominance and other community attributes. The trophic level biodiversity will speak about the functional dynamics of various animal groups such as producers, consumers (primary, secondary and tertiary) and decomposers and their value in the cycling, recycling and replenishment of matter and energy in different ecosystems of the world. The economic level biodiversity refers to the man made changes in the various natural habitats, communities, ecosystems wantonly to reap benefits for human kind as well as to build up the economic value of the above. These economic level biodiversity will reduce the natural genetic diversity. Though each one of the above mentioned types have their structural cum functional attributes, understanding them in totality would make one to assess how the natural environments have undergone changes and the role of man in instituting the above changes for the best or the worst.

WILDLIFE BIODIVERSITY

Wildlife as a whole may denote the diverse species of organisms of both micro and macro level organizations. According to Indian board for Wildlife, "Wildlife to mean the entire natural uncultivated flora and fauna of the country". According to Wildlife Protection Act (1972), "Wildlife defines to include any animal, bees, butterflies, moths, crustaceans, fishes and aquatic or land vegetations which form part of any habitat". In spite of all such definitions for wildlife, much attention with regard to biodiversity is being given only to such species, which come under various categories such as endangered, vulnerable or rare. The endangeredness of wildlife is also categorized into local, national, international, continental and global. Regarding Invertebrata, the division concentrates more upon certain conspicuous classes or phyla such as Insecta, Crustacea, Mollusca and Echinodermata, and parasites for the theme of biodiversity. Similarly, Pisces, Amphibia, Reptilia, Aves and Mammalia constitute the biodiversity classes in the division Vertebrata.

Indian Faunal (Wildlife) Diversity

Indian faunal and wildlife diversity is tremendous, numbering about 81,251 species. Of these, insects constitute about 60,000, molluscs, a little over 5,000, mammals 372, birds 1,228, reptiles 446, amphibians 204 and fishes 2,546. India has presently 84 national parks and 447 wildlife sanctuaries covering about 1.50 lakh Sq. Km. area, which is nearly 4.5 percent of the total geographical area of the country. Wildlife thus represents an integral part of forests and environment in India as well as in the world. India represents one of the world's mega diversity zones constituting 2% of the world's total land mass and 5% of world's flora and fauna. The mighty Himalayan biomes, the tropical rain forests of Assam, Meghalaya and Western Ghats, Sunderbans, Cold desert plain of Tibet Plateau and Hot desert of Rajasthan all make a congenial eco-climate for diverse wildlife. It can support upto 20,00,000 species. However, it is estimated that 53 species of mammals, 69 birds, 23 reptiles and 3 amphibians are threatened and come under IUCN Red List Category (Groombridge, 1993) (IUCN 1994).

WILDLIFE VALUES

As wildlife is a bounty of nature, all nature's values could also be attributed for wildlife. They are the productive value, aesthetic or recreational value, optional value, consumptive use value, social value, ethical and moral values. All these values reflect upon man's interaction and dependence over nature and wildlife. The last ethical/moral value, however, delineates the human attitude towards other co-creations, viz., the animals, which have an equal right to live and emphasizes upon the regulations of the other wildlife values mentioned per se.

HUMAN FOLLY AND SIN

The fast deeds of mankind in the past decades reveal that in the name of survival and transformation human generation all over the world has committed folly and sin to nature and wildlife. In the past few decades, several million hectares of forest habitats, which are the abode and genetic reservoirs of wildlife biodiversity, have been denuded for supplying raw materials to industrial revolution and cultural renaissance. By doing so, man and industries have left over the trails of different dimensions of environmental pollution. Several thousand hectares of forestlands have been transformed into cultivable lands for agriculture. Forestlands were encroached for human settlement. The same were also acquired for the construction of railroads, hillroads, irrigation and hydroelectric projects. Industries and mining have also seriously denuded these forests. Valuable trees of commercial importance are illegally felled and smuggled by unlawful forest brigands, mafias and greedy contractors. All these human activities, though may be termed achievements and conquests of nature, in the true sense, they are nothing but overexploitations, abuses, follies and sins. Animals were killed for the cash they fetch. Wild habitats were grabbed and gobbled up under the guise of development. The relationship between man and nature, which was interwoven in the past, is now broken down. The roots that bind the people and nature together have been trampled and weakened. Traditional values vanished as modern man (Neolithic) pursued the path of a new GOD, viz., "Easy Money".

WILDLIFE CONSERVATION - CURRENT PERSPECTIVES

The awareness of wildlife importance has prompted the formation of several action plan committees, promulgation of environmental laws and wildlife acts, projects and several other protective measures. These include the following:

- 1. The United Nations Educational Scientific and Cultural Organization (UNESCO) initiated in 1971, the Man and the Biosphere Programme (MAB).
- 2. Wildlife Protection Act (1972).

- 3. Project Tiger (Govt. of India, 1973) About 27 Tiger reserves New strategies for conserving tigers.
- 4. Project Elephant. 1991-92: Asian Elephant Research and Conservation Centre (AERCC). The Convention on International Trade in Endangered Species (CITES) included Asian elephants in its endangered list. Red Data Book (IUCN)
 Listed the species International Monitoring System Monitoring of Illegal Killing of Elephants (MIKE) Elephant Trade Information System.
- 5. Project Rhino [Govt. of India 1987]: in Assam centrally sponsored scheme WWF assistance. Rhino-Action plans formulated, WWF M.S. Swaminathan Foundation.
- 6. Animal Welfare Board.
- 7. National Forest Policy (1988).
- 8. Central Zoo Authority (CZA) 1992 under Wild Life Act.
- 9. ISO certification ISO 14000 Certification for Environmental Management Systems Guidance Standard, ISO 14001 – EMS specification document.
- 10. Environmental Impact Assessment (EIA) 1994 (made mandatory).
- 11. Environmental Appraisal and Monitoring Unit (EAMU) by Power Finance Corporation (PFC) deputation of environmental engineers.
- 12. India is a contracted party to World Heritage Convention, Convention on Biological Diversity, Ramsar (Wetlands) Convention, etc.
- 13. *In situ* conservational methods like cryogenic preservation of genetic materials and embryos of wild life animals, super-ovulation, *in vitro* fertilization, cellular and genetic manipulation of eggs and embryos, cloning, embryo transplantation, etc.
- 14. *Ex situ* conservational strategies like establishment of Zoos, National Parks and Sanctuaries, design of wild life habitats, design of nutrients to animals, animal health monitoring and preventive medicine; vaccination and immunization, clinical surveillance, retrospective disease surveys, use of new diagnostic and therapeutic devices, etc.

WILDLIFE EROSION BY NATURAL ISOLATION AND ENDEMISM

Several intrinsic (physiological) and extrinsic (geographical) factors play a role in the dimunition of some species naturally even in the wild. Intra specific regulation has been noticed in the animals of oceanic islands and in some species of terrestrial environment also. In the past, some animals have been geographically isolated by continental drifts. Similarly oceanic islands and their fauna have been isolated from the rest of the world. Even in large terrains, species are separated by insurmountable barriers such as high mountains or large rivers. Species are separated by ecological niches also. Such isolations prevent intermixing of animal populations. Physiologically, incompatible breeding seasons can reproductively separate the populations. In all these cases, lack of exchange of gene pool lead to a phenomenon called Endemism. Such endemic populations are very common in several countries. Man made endemism endangering the very survival of wild animals may be witnessed in the near future when the icy sheets of Antarctic and Arctic regions melt away due to global warming, leaving the island's fauna completely cut off from each other. The species, which are undertaking inter island migrations will be completely cut-off, isolated and may die of starvation and may slowly become extinct. These isolated benign habitats representing the 'Hotspots' with the fragile endemic species are prone to great risks of destruction. The mechanisms of isolation endemism that may reduce biodiversity are as follows.

- 1. The animal migration route may be blocked for the animals.
- 2. The species population sometimes may fall below a minimum viable size (Kalahari Desert Botswana tribes in human).
- 3. Small populations with low genetic variability and inbreeding are at greater risk.
- 4. Reduction of plant communities and vegetation will have a direct impact on residential animal diversity and community.
- 5. If some keystone species in all trophic levels disappear, it will have detrimental effects to the whole system of biodiversity, analogous to a building collapse when the keystone is removed.

INCIDENCE OF EXTINCTION – PAST

Instances of extinction of animal species in the past history of earth, which are about five thousand million old years, raised spectacular interest and informations have been collected to the questions about their extinction. One of the most unique incidence of extinction was that of the terrible lizards, viz., the dinosaurs which appeared on earth some 230 million years ago towards the end of the Triassic period and reigned the earth as monarchial forms for about 165 million years and became completely extinct about 65 million years ago without even the trace of a single species. Several theories and assumptions have been attributed for their extinction phenomenon such as meteorites hit hypothesis, volcanoes hypothesis, climatic change hypothesis, brain-somatic ratio hypothesis, etc. Though the extinction of dinosaurs, wooly mammoths and saber toothed tigers still remains enigmatic, geological/geographical evidences attribute an ultimate hostile change in their environments for their total extermination. Similarly, the extinction phenomena which have occurred recently before two hundred years like the 'Dodo" bird also revealed that the disturbance to their environment was the cause for their disappearance. The past events of extinction thus proclaim an alarming signal to the existing species of wildlife fauna and also for mankind. The manmade phenomena like greenhouse effect and the consequent global warming, ozone layer destruction, the frequent occurrence of earthquakes, volcanic eruptions, thermal inversion, eutrophication of water bodies, environmental contaminations, radiation hazards, etc., are all nothing but the grim reminders of a forthcoming tragedy.

WHAT TO BE DONE? (TO BE OR NOT TO BE!)

Man with his immense potential of brain power and machine power, should strike a balance in his activities to reap the benefits from nature on the one hand and to restore the intactness of nature on the other by remedial measures.

Robert Vanden Bosch in his book "The pesticide conspiracy" cautioned mankind in the following words

"Nature is emitting signals warning that under the existing format the future is ominous. She is saying that we cannot continue our attempts to ruthlessly dominate her and that if we persist, disaster is in the offing. She has many voices.

- ♦ Voice of the trees
- Voice of the water
- ♦ Voice of the soil
- Voice of the wind

The voices of nature are quite easy to hear – If we will only listen. The question is will we? An if we do, can we overcome our corrupt ways and marshal our efforts to collaborate with nature as her brightest child and shepherd of Earth's life system? If not, it is almost certain that things will worsen for nature but even more so for us. Then at a certain point in time, we may no longer be able to cope with the adversity and we will perish. But nature will survive". Hence it is high time and right time, every individual contributed on his part to restore nature and wildlife without any procrastination.

FUTURE ZOOLOGISTS

Zoologists of the future years have to specialize, alongside with the theoretical aspects of populations, communities and ecosystems, the computer oriented

bioinformatics wherein the field data collected with regard to a species and its genome could be superposed with their environmental niches/habitats to arrive at conclusions with regard to the species survivability. This will lead to information sharing between different zoogeographical regions of the earth. The above concept of information sharing and data dissemination and communication through world wide web (WWW) deployed on internet would have profound implications in conservation and management of wildlife biodiversity. The bioinformatics science will enable all zoologists to undertake 'Virtual Ecotourism' to collect data, interpret and formulate hypotheses and theories regarding biodiversities of various geographical habitats, transcending the real barriers and contribute for their rehabilitation.

RECOMMENDATIONS AND CONCLUSION

Individuals can safeguard wild animals by so many indirect ways:

- by giving up their hunting spree even for avocation.
- by refusing to buy products made from rare animals.
- by becoming aware of events that affect wild life.
- by prodding lawmakers to pass sound conservation legislations.
- by becoming members of eco-organisations and private conservation groups.
- by opposing the introduction of exotic species, as they may threaten our native animals.
- by recreating forests and ecosystems and by introducing the species native to that area.

Individuals can form eco-clubs locally and work together in unison to heal the wild life world.