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Sana Naseem
Department of Zoology
University of Gujrat, Pakistan

Dr. Mubashar Hussain
Assistant Professor,
University of Gujrat, Pakistan

Talhat Munir
Department of Zoology,
University of Gujrat, Pakistan

Environmental protection for biological conservation: A Review

Sana Naseem, Dr. Mubashar Hussain and Talhat Munir

Abstract

Environment deteriorates with human activities such as hunting, deforestation, land fragmentation, pollution and limitless use of natural resources. Population of humans increases very rapidly especially in developing countries and it has worst effects on environment. Protecting the environment will cause the biodiversity conservation. Different methods are used for environmental protection such as environmental sensitive governance, environmental law, environmental sensitive planning and environment consciousness. Changing in the features and extinction of species is indication for us to start the systematic conservation planning. Ecosystem approaches and ecological developments are very helpful to apply global act on biodiversity.

Keywords: environmental protection, biological conservation, environmental protection process, conservation biology

Introduction

The ecosystem services as the most valuable gift of nature for all life forms especially human beings has made life dynamics and diversified^[31]. The ability of ecosystem resilience and self-sustenance under natural condition is act the balance of structural and functional aspects of biosphere^[18, 9]. All human societies and ecosystems based on productive and healthy natural environment. 10 million species of animals, plants and microbes are present in this earth^[26]. We generally ignored these services and don't give them value until there is any danger of extinction of these sources^[18, 26].

Planning of environment includes the environment protection through enhancing the biodiversity conservation, use of natural resources and ecological services^[1]. Environmental protection planning must be efficient, economical, visionary and ethical^[28]. Green development term is mostly used, it does not only relate to reduction in pollution but it also involves in re-establishment of resources, biodiversity and ecological services^[18, 28]. Problems of environment have initiated from when man wants to change the environment into that form which he desires^[11]. Man exploiting the environment by industrial advance processes which are the main reason of pollution in last century^[8, 2].

Environmental protection

Protection of environment includes the activities which are used to sustain the value of environmental media by reducing the release of pollutants or lessen the number of pollutants in environment^[2]. Environmental protection consists of recycling, prevent ecosystem from degradation, change in patterns of consumption, change in technique of production, change in features of services or goods and treatments of waste^[24].

Environmental protection process

Environmental protection process comprises numerous components. Main components of environmental protection are environmentally sensitive governance, environmental law, environmental sensitive planning and environment consciousness^[29]. If any of the factor from all of these factors is missing no environmental protection occur^[25].

Correspondence
Sana Naseem
Department of Zoology
University of Gujrat, Pakistan

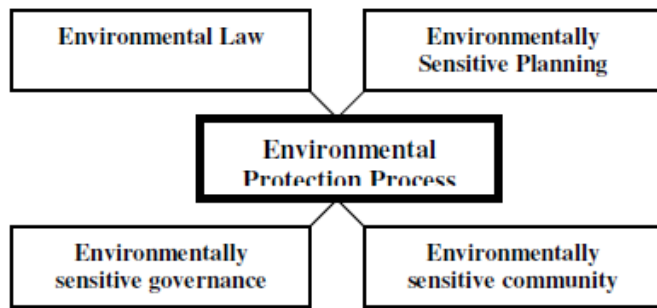


Fig 1: Environmental protection process

Environmental Law

It is starting of environmental protection. It regulates numerous rules related the protection of environment [6, 4]. Environmental law is group of laws which are complex of interlocking status, treaties, regulation, conventions, polices and common law which peruse to guard the natural environment which are affected by the activities of humans [10]. Environmental laws control the nature, quantity and impact of activities of humans and also control the impact before activities of human occur. In 1960s environmental law arose in main industrial economies [7, 4].

Environmental sensitive planning

Ecological characteristics and natural resources are taken in consideration in all the type of planning processes. Planning involves spatial organization formation to develop welfare of society [15, 9]. Currently perspectives in planning strategies focused on the natural resources and their ecological development [8, 7]. Besides all these it is practiced that regional and local planning focused on the ecological sources. Decisions of land uses which are related to housing areas have effects on the physical environment, topography, fauna, flora, soil and natural biotopes [7, 19].

Environmental impact assessment is most important way of management of environment because it has ability to determine problem of environment and their prevention then we can lessen the economic costs [5, 20]. Strategic environmental impact assessment is essential to be recognized at the starting of planning processing, on the other hand environmental impact assessment has been recognized afterward planning, but earlier than sectorial act [15, 25].

Environment sensitive Governance

Meaning of governance is a decision making process. Environmental protection is assisted by local governance [19]. Effective governance aids us to build up democracy, social cohesion, reduce poverty, enhance economic prosperity and increases environmental protection [4, 10]. Main elements of environmental sensitive governance are accountability, consensus, efficiency and participation [8]

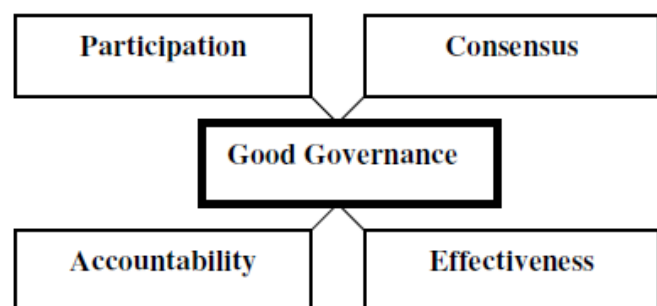


Fig 2: Components of good and effective governance

Environment sensitive community

When moving toward conservation it is necessary to focus on participation of individual in community [13]. Consciousness of environment is central part of humanity. An individual person must know the relationship between environment and individual [23]. Human activities can destroy environment if they have no knowledge about what they are doing; so change in the attitude of human occur by giving them proper knowledge about environment. Public awareness is also important step to protect environment [26, 30]. Social consciousness also increases by following the components of good governance [14]. So every individual in a community must improve their environment consciousness. It is based on “think globally, act locally” (Diaz *et al.*, 2001).

Conservation biology

Biodiversity includes the variety of whole species present on earth. It consists of various kinds of plants, micro-organisms, animals and different types of ecosystems in which they live. For our existence biodiversity is very necessary because it is basic building block for most of services and goods that gives healthy environment [31, 1, 3].

Conservation biology is scientific study of earth’s biodiversity and nature with respect to species protection, habitat protection and ecosystem from rate of extinction and loss of biotic interactions [5, 7].

Biological resources

Any product that get from nature is constituent of biological resource. There are various kinds of resources such as wood products, medicine, food, fibers etc. if we take the example of plants there are 7,000 plant species are present but we consume only 12 main crops as food [12, 6, 8]. In field of medicine most of the medicines are made from the plants for example quinine is used for cure of malaria is made from cinchona tree. Fiber is used for different purposes such as webbing, netting, rope and sacking is obtained from cotton plants [23, 21, 5]

Systematic conservation planning

It is very effective for local ecosystem support and also helpful to identify and classify the various kind of reserve design to tolerate the maximum biodiversity values [14, 13]. Only reserves are not sufficient for conservation of natural resources. There are two major roles of reserves. Reserves have two main roles [12, 6]. These reserves must be in the form a sample which characterize the biodiversity of every region or they must isolate this sample of biodiversity from the threat that are dangerous for them [20]

Threats to biological diversity

There are 5-15 million species of eukaryotic organisms it shows that species are distributed widely but the most concentration present in the tropical ecosystems. In some hotspots endemisms are present that are effected by the habitat loss. On the basis of geological data now it is considered that for the past 300 years extinction rate of species is high [14, 13, 8]. There are several threats to the biological diversity such as overexploitation, climate change, nutrient loading, habitat change and invasive alien species. Major force for environmental change is human being and now main aim of the conservation planning is to outcome these changes [5]. Threats that are related to activities of humans are known as keystone threats e.g., land use. In recent centuries impact of human on resource extinction is increased [4]. Change in biotic communities occurs because human convert the land cover.

Change in extent of disturbance and severity, rate of species invasion, mass extinction and change in global biogeochemical processes are all due to human activities [27, 22]. Organisms are mostly threatened from numerous factors such as physical habitat damage, climate change, changes in atmosphere, overexploitation, deposition of nitric oxide and diseases [15, 8]. These threats are connected to fundamental drivers which are identified and conservation action is done. Like keystone species, keystone threats have strong impact on environment because if we remove the keystone threat it has positive effect on the environment [4, 2].

Diagnosis of threats is required to protect the freshwater resources. Developed countries use the modern technologies to cope with the threats while under developing countries face more problems to protect the fresh water biodiversity. Less precautionary measures also lead toward the biodiversity loss; it is considered that habitats that are linked with the 65% of continental discharge are considered as highly threatened [30]. Major threat for the biodiversity of marine ecosystem is invasive species. These species can be introduced by the variety of ways such as aquaculture and international shipping are considered as major cause [21].

Impact of invasive species increases with the passage of time and it causes threat for other native species as well as it has worse effect on the human health. In the ballast water some developments have been done globally on the 10,000 species. To manage the risk collaboration between the regional trading pattern will be ensured [4, 16].

Nitrogen effect the vegetation diversity when its concentration increases, it effect the eutrophication, acidification, secondary stress susceptibility and foliage damage x. Species of plants that are managed at less nutrient level are mostly effected by the increased level of nitrogen [17].

Climate change is also considered as the major cause of biodiversity loss. Different gases such as ozone, carbon dioxide, methane and water vapors can cause greenhouse effect in the atmosphere by trapping the heat in the planet [1]. All these gases are emitted by different ways but it is considered as the major cause is human activities that are land use changes, farming activities and fossil fuel burning. All these activities increase the temperature on the earth that is very dangerous for the biodiversity.

According to the fourth assessment report of intergovernmental panel on climate change (IPCC) the increase in average temperature occur that is 0.76 °C from 1850-2005 and global mean sea level raised by 12-22cm during the last century [5].

Major tactics for sustainable use of biodiversity

Major harvesting quotas

It includes the cap value to bound the intake e.g., if we want to sustain the fish harvesting we should maintained limits that can be based on structure of population and changed from time to time. Rules should be present for fishing that protects the fish in its ecosystem and enhance its production [2, 5].

Protection of critical habitats of endangered species

It contains social facilitation, services, ecological resources and community interactions. E.g., for feeding large space territory is basic need for carnivores and predatory birds. When we talk about behavioral requirements and distribution patterns some birds such as herring gulls require large area for courtship behavior. If very large population is present and there is no predator is present it will enhance the competition, starvation, disease spreading and at last unhealthy population will result [3, 1].

Captive propagation

When breeding in captivity occurs it contain many factors such as reduce inbreeding, behavioral alteration and disease risk. In captive breeding species securing occur e.g., sanctuaries and orphanages [2, 6].

Ecosystem preservation

During ecosystem preservation effect of climate change, genetic conservation, spread of disease, catastrophic disturbance, requirement of species at various trophic levels, equitability of habitat, ecology of landscape, availability of food, breeding sites and ecosystem services are take in consideration [2, 6, 15].

Legislation, conventions and public involvement

Enactment of rules against pollution, overexploitation, habitat destruction and poaching must be followed. Strategic environmental assessment and environmental impact assessment tools must be present. Public awareness must be present that reduce the biodiversity loss [2, 17].

Conservation

The present extinction and global crisis of biodiversity has negative effect on the species. Biodiversity conservation is important to reduce the extinction of biodiversity by humans [3, 12]. Sustainable development done by ex-situ or in-situ conservation such as protection of genetic diversity occurs that is mostly threatened by the extinction [23]. Different international and national programs are established to aware the ex-situ and in-situ conservation such as botanical gardens and gene banks are established for the ex-situ conservation. For example gerplasm of crop that is present in the landraces is protected by ex-situ conservation [12].

On the other hand the factors that enhance the in-situ conservation are economic isolation, land holding fragmentations, hill land agriculture and heterogeneous soil. In-situ conservation preserve the social and biological process for biodiversity evolution [6, 13].

Conclusion

Environment protection is very important to conserve the biodiversity. Ecosystem approaches and ecological developments are very helpful to apply global act on biodiversity. Population of humans increases very rapidly especially in developing countries it has worse effects on environment. Ecosystem and species faces many threats such as ozone depletion, hazardous chemicals and change in climate. If we do not take action for environmental protection it will lead toward decrease in biodiversity. If society and government take action for conservation of biodiversity it will enhance a better relationship between environment and humanity.

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