

REVIEW ARTICLE**Human Influence and Threat to Biodiversity and Sustainable Living****Debela Hunde******Abstract***

More than half the habitable surface of the planet has already been significantly altered by human activity. Scientists suggested that this planets species are on the verge of mass extinction while our knowledge of diversity and variability of plants, animals, microorganisms and the ecosystem in which they occurs incomplete. Hence, "Biological diversity is the variability among living organisms from all sources, including interalias, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part". The values, deriving forces and human influences, as well as the measures for conservation and sustainable use of the biodiversity vary greatly with in and between different cultures. Recent estimates have shown that humans use or pre-empt 40% of the terrestrial component of net primary productivity (total photosynthetic production). No part of the world is considered truly undisturbed; indicating that the world's habitats have been significantly modified by human action. Humans' influences affect biodiversity by: (1) agriculture, fisheries and over harvesting of resources, (2) habitat destruction, conversion, fragmentation and degradation, (3) introduction of exotic or invasive organisms and diseases, (4) Pollution of soil water and atmosphere and, (5) global change. All these impacts call for the promotion of environmental friendly living with biodiversity. Environmental friendly living exists within the socio-economic value of biodiversity. Biodiversity conservation, cultural survival and the search for new products are intractably linked. Ethno ecology, the study of the management system of indigenous people, which is particularly important for its application to the action of sustainable, uses systems, must be prompted in communities. This needs to adapted many indigenous techniques and values because they are (1) provide a medium to link people to their ancestors (2) cultural ceremonies frequently make use of biodiversity. It is also good to note that community participation and benefit sharing are not the sole solution to conserve ever increasing biodiversity degradation. There is a need to have balance vision and supportive sectarian and cross- sartorial actions of the governments with local, national, regional and international consideration that can save the biodiversity. Any strategy to slow the loss of biodiversity and to enhance its contributions to development must integrate conservation of biodiversity, sustainable use of its components and equitable sharing of benefits at all levels

**Jimma University, College of Agriculture and Veterinary Medicine, Department of Natural Resources Management Jimma, Ethiopia*

1. INTRODUCTION

The conscious concept of biodiversity started when people start to think about and ask themselves are we facing global biodiversity crisis or indeed are we in the midst of one, as several others have suggested (GBS, 1992). These and similar questions have been asked during the past three and half decades arising out of a growing concern due to the rapidly accelerating loss of species, populations, domesticated varieties and natural habitats such as tropical rain forests and wetlands. Truly speaking questions of diversity of life have occupied peoples mind for as long as we have inhabited this planet (GBS, 1992).

It appears that the term biological diversity was first defined including two related concepts genetic diversity (the amount of genetic variability within species) and ecological diversity-the number of species in a community of organisms (Norse and Memanus, 1980 cited in GBS, 1992). Ecological diversity refers to the numbers of species in given areas, the ecological roles that these species play, the way that the composition of species changes as one move across a region, and the groupings of species/ecosystems that occur in particular areas such as grassland or forest together with the processes and interactions that take place within and between these systems across land scape and biomes (GBS, 1992). Recent estimates suggest that more than half the habitable surface of the planet has already been significantly altered by human activity. These concerns have been coupled with a realization that our knowledge of the diversity and variability of plants, animals, microorganisms and the ecosystem in which they occurs is incomplete. It is this situation that led to the introduction of

the notion of biological diversity that emerged some 15 years ago (Lovejoy, 1980; Norse *et al* 1989).

The definitions need to recognize specifically the three principal components, ecosystems, species and genes in common use. These three major components of biodiversity are recognized in the definition in Article 2 of convention on Biological Diversity adopted in 1992, as follow “Biological diversity means the variability among living organisms from all sources including inter-alia, terrestrial, marine and other aquatic ecosystem, and the ecological complexes of which they are part, this includes diversity within species, between species and of ecosystem” (GBS, 1992). Strictly speaking the word biodiversity refers to the quality, range or extent of differences between the biological entities in a given set. In total it is diversity of all life and is characteristics or properties of nature, not an entity or a resource (Jensen *et al*, 1990). The multi faceted nature of biodiversity is reflected in many definitions that have been put forward. Increasing environmental awareness over the past few decades has highlighted the need to enhance our understanding of the ways in which human society and biodiversity interact. This has widened the scope of biodiversity so as to include the human dimension. The purpose of this writing is therefore, to contribute to the effort underway in promoting awareness on environmental friendly living in biodiversity conservation.

2. Human Influence and Threats to Biodiversity

Biodiversity is considered as a synthesis of the various biological disciplines that contribute to it. It covers the values, deriving forces and human influences, as

well as the measures for the conservation and sustainable use of biodiversity within and between different cultures. This is sometimes referred to as cultural diversity (GBS, 1992). It recognizes the important role of sociological, ethical, and religious and ethno biological values in human activities. The magnitude of human induced environmental change at the global scale is considered to be enormous. Globally, humans are now the dominant influence on biodiversity. Recent studies have estimated that today humans use or pre-empt 40% of the terrestrial component of net primary productivity (total photosynthetic production) (GBS, 1992). Furthermore, the main force driving the global transformation of the biosphere is human population growth, together with increasing resource consumption and socio cultural change. Inevitably this raises the question of carrying capacity of the planet and whether we can continue to increase our demands on it without limits or not. Strictly speaking, no part of the world is considered truly undisturbed. The worlds' habitats have been significantly modified by human action terms such as undisturbed or virgin forest is now days considered of little value.

Hauff (2002) in his sustainability analysis pointed out poverty forces many people to strip away too many valuable resources and biodiversity is under threat at alarming rate. Australian Museum (AM) (2005) released report state that "in the Earth's 5.5 million years history, there have been five major mass extinctions recorded in the fossil record, the most recent of which, 65 million years ago, killed the last of the true dinosaurs. Currently extinction rates rivaling or exceeding the rate of the prehistoric mass extinctions. Although majority of all animals that once lived on earth are now extinct, the mass destruction attributed to one species (our own) is

apparently unique in the earth's history". This indicates that biodiversity loss can be attributed to the resources demands of our rapidly growing human population. In recent times, the human population has increased from about 1 billion in 1990 to almost more than 6 billion today. Like other living beings, humans use the natural resources to survive, but humans are far resourceful and destructive to other life forms than any species previously known. The major human influences which affect biodiversity can be summarized: (1) agriculture and fisheries and over harvesting of resources, (2) habitat destruction, conversion, fragmentation of habitats i.e. degradation and loss, (3) introduction of exotic or invasive organisms and diseases i.e. non- native invasive species (4) overuse of resources resulting to pollution of soil water and atmosphere, and (5) global environmental change. As the world human population increases, all the organisms on Earth including humans must have share the same limited resources (food, shelter, space, water, and others). Yet there is less and less natural habitat remaining as land is developed for humans' habitation and activities.

2.1 Threats to Biodiversity

Extinction is a natural event and from geological perspective routine i.e. most species that have ever lived have gone extinct during different geological time. According to AM (2005) report the average rate over the past 200 million years is 1-2 species per million species per year. Furthermore, it has been noted that, the average duration of a species is 1-10 million years (based on last 200 million years). In modern era, due to human actions, species and ecosystems are threatened with destruction to an extent rarely seen in Earth history (AM, 2005).

Human activities have greatly reduced biodiversity of the world in various ways (IBCRa 2001). Habitat loss as humans develop land and water for agriculture, grazing livestock, and unsustainable use such as draining wetlands and deforestation for agriculture land and polluting the air, soil and water through unwise use of chemical compounds such as herbicides, insecticides, etc greatly affect biodiversity (IBCRb, 2001). The devastation of forest ecosystem is also heavily continued with fast rate. As forest take up a quarter of the land surface and are immensely important for the earth's ecological balance and hence appropriate conservation measures must be taken for sustainability of the forest resources and biodiversity in it Hauff (2002). The same analysis showed that, 15 million hectares of forest are destroyed each year. Hauff (2002) extended his analysis that, the great diversity of flora and fauna plays a vital role in global survival and yet each day 50 different species become irrevocably extinct. The consumption of fossil energy and drinking water is increasing and yet many millions of people still have hardly any access to these resources. Furthermore, desertification has immensely increased fast (Hauff, 2002). Overgrazing, over intensive cultivation, deforestation and faulty irrigation are some of the causes.

The world population is increasing by 100 million people a year, while the amount of farmland is steadily declining. Between 1991 and 1997 the area of land available and used for the production of food fell from 0.44 to 0.26 ha per head and decrease approximately 0.15 ha by the year 2050 Trittin (2002). One reason for this is desertification Trittin (2002). Particularly important are the challenges involved in the global conservation of limited resources such as land and water. Hunger forces people to strip away too many valuable

resources. Overgrazing, over intensive cultivation, deforestation and faulty irrigation are just some causes of desertification due to increase in human population (Hauff, 2002). Hence ensuring the future feeding of the world's populations requires putting an end to deforestation and loss of valuable land resources. In many places equal land distribution the so-called access to land is a basic requirement for viable long term use of land. Harmful substances in land and water become time bomb for future generations who need these resources available outside mild climate zones are too scarce to sustain development. As many people concentrate on the use of few space and resources the erosion of soil, destruction of water, vegetation and animal biodiversity affects nearly 70% of all arid regions on earth (Hauff, 2002). Tropical rain forests are important; because they harbor at least 50% and perhaps more of world's biodiversity under threat. The original extent of tropical rain forest was 15 million square km. currently there remains about 7.5-8 million square km so that half is gone. The current rate of loss is estimated near 2% annually 100,000 square km destroyed; another 100,000 degraded while there is uncertainty regarding the rate of loss and what it will be in the future, the likelihood is that the tropical forests will be reduced to 10-25% of their original extent by late twenty first century (AB, 2005). This gradually leads to losses resilience irreversibly thereby ending in desertification. The overuse of natural resources, frequently the result of need and hardship is destroying some five to seven million hectare of arable land and pasture worldwide each year. Therefore, food production will have to be more than double to supply sufficient food for the established global population of 8.5 billion in 2025 Trittin (2002).

Humans are part of biodiversity. There was harmonious co-habitation of humans and biodiversity on the primitive earth i.e. dynamic equilibrium existed between biodiversity and humans. Later on because of five major changes human beings put heavy pressure on biodiversity: (1) Fast in growth of human population, (2) Increasing human needs, (3) Fast in domestication of animals (4) Increasing human needs, (5) increase in human competence with technological advancement to exploit the biodiversity (GBS,1992). According to Mooney (1985) human dependence on biodiversity is much for more food, shelter, medicine, fuel, recreation, etc. He furthermore described that traditional society are in harmony with biodiversity, poor struggle to live, minimum resources utilized while developed nations have an affluent exploitation of resources, high level of consumption by minority. This further evidenced that technological development has greatly impacted and threatened biodiversity of the world at all levels.

Applying traditional means of preserving biodiversity of the threatened biota is important. Traditional protection of threatening biodiversity, by restricting collection of germplasm, hunting, and deforestation contribute a lot in conservation (IBCRA, 2001; Regassa Feysa, 1999). Preserving biological diversity in churchyards, mosques, and vicinities of Irrecha forest or Aba qalluu' which are ritual and spiritual areas are secure areas for medicinal plants and other components of biodiversity conservation and sustainable use in Ethiopia (Debela Hunde, 2001).

Effective conservation of biodiversity can only be achieved through the sustained efforts of all, most importantly rural communities who largely rely on local

biodiversity for their livelihoods .This is attributed to the message "saving life by saving biodiversity" which is more directly related to the bread of everyone. According to IBCRa (2001) people who are well versed about the biodiversity and their uses need support from governmental, non-governmental organizations and scientists to enhance and develop their traditional sustainable use practices (Prance, 1991).

2.2. The Need for Environmental Friendly Living.

The main forces deriving the global transformation of the biosphere are human population growth, together with increasing natural resource consumption and socio cultural change. These are continuing to increase at alarming rate. This raises the question of carrying capacity, of the planet and whether humans can continue to increase his demands without limits (GBS, 1992). The answer for this question is it is impossible to increase humans demand on natural resources with out limit and without conservation of these resources. This calls for environmental friendly living. Environmental friendly living can be achieved if only conservation and sustainable use of biodiversity effectively practiced. Conservation in narrower sense is the preservation or maintenance of some or all of the components of biological diversity. In broader sense include sustainable use of the components, or their recovery or restoration or both (GBS, 1992). Hence, environmental friendly living is meant the sustainable use of natural resources, so is biodiversity as one of the major part of environmental components. In this regard, environmental friendly living /sustainable use of biodiversity encompasses, the use of components of biodiversity in a way and at a rate that does not lead to the long term decline of biodiversity, thereby maintaining its potential to meet the needs and

aspirations of present and future generations (GBS, 1992).

Environmental friendly living must give due considerations to strategies for biodiversity considerations and sustainable use of it. It has the basic principles given in Convention on Biodiversity. It states that "any strategy to slow the loss of biodiversity and to enhance its contributions to development must integrate conservation of biodiversity, sustainable use of its components and equitable sharing of benefits at all levels." Policy makers should proceed cautiously when making interventions in the natural environments so as to safeguard against unexpectedly severe future. It is difficult to predict the future of any component of biodiversity based on current use. It is also impossible to forecast the needs and demands of human beings that might arise, on which are on use to day and those not used. Hence, it will be difficult to underline basic evidence to discard one or another genetic material because there is no means of telling when and which genetic material may be useless. This in turn suggests that genetic multiplicity, covering wide range that exists today must be conserved. From a biological point of view the genetic multiplicity represents the basis for adaptability and improves the chance for survival of the species (Tabel, *et al*, 1996). Human influences as well as the subsequent deteriorating of living conditions for components of biodiversity (e.g. Tree and shrub species) gives cause for fear that the natural genetic mechanisms will not be sufficiently to counteract the rapid loss in genetic multiplicity successfully (Table *et al*, 1996). On top of this, genetic multiplicity has to be maintained for economic ethical reasons too. A large genetic multiplicity will be better able to meet demands and requirements of future generations under

possibly changed environmental conditions. Furthermore genetic multiplicity serves as a buffer against biotic and abiotic influences. It is necessity because of the long rotation age.

Genetic multiplicity can be maintained if environmental friendly living is widely practiced by rural communities of the globe who have direct and intimate relation with biodiversity (Werede, 1988). The problem of environmental friendly living should be seen in a holistic manner within the overall context of environment and developments, taking into account the multiple uses of biodiversity including the traditional use by communities. Some of the issues to be taken into account include traditional vegetation, soil conservation and other resources conservation practices. The sustainable socio-economic, ecological, cultural and spiritual human needs for present and future generations require indigenous people's participation of each community and benefit sharing. Its role is to enhance the understanding of sustainable conservation issues and improve communication. It also helps in consensus building, negotiation and conflict resolution to achieve the goal of sustainable conservation and development. Hence, the traditional use rights of the local people on biodiversity for different purposes, the economic value of these resources for the particular locality, region, nations and international considerations should be the basis for participatory approach for sustainable conservation of bio diversity (IBCRa, 2001). The direct benefits to the communities such as forest management approach include: employment, traditional use rights including grazing wood collection for own consumption, collection of non forest products, bee keeping, practicing spiritual and ritual ceremonies (Misrha, 1994; Debela Hunde, 2001). It is good to note that community participation

and benefit sharing are not the sole solution to conserve ever increasing biodiversity degradation. There is a need to be vision of undistorted professionalism (balanced vision between development and environment) supportive sectarian and cross- sarritorial actions of the government with local, national, regional and international consideration can save the biodiversity.

3.1. Future Trends of Environmental Friendly Living and Indigenous Knowledge

In order to benefit continuously from natures blessings, man must of necessity preserve the indigenous knowledge and conserve the biodiversity form which he derive his livelihood. Indigenous cultures have a history of ecologically sound relationship between man and the environment (Kafi Tsekp, 1993). Various African traditions have developed valuable cultural attributes in the form of religious beliefs, myths and taboos that serve to conserve and manage the natural environment (Kafi-Tsekop, 1993). These important cultural attributes and the natural habitats they helped to conserve are threatened due to the impact of modernization on indigenous cultural norms (Cunningham, 1993; Debela Hunde, 2001). Bodies of indigenous knowledge are structured by systems of classification, sets of empirical observations about local environments, and systems of self management that govern resource use (Mishra, 1994; Zemedede Asfaw,1998; Mirutsi Giday,1999; Daba Wirtu, 2000).

They are accessible in the first place to those members of a social group changed with specific management and production responsibilities. In this sense, indigenous knowledge systems are by their very nature gendered. They are fuelled by the experimentation and innovation of those

groups within a community which have been assigned specific production and management responsibilities. Women make an important contribution to the traditional economy, minor forest produce economy, communal and homestead lands (Mishra, 1994; Roba, 2001; Daba Wirtu, 2000). There has been a growing interest in women indigenous knowledge systems. Their knowledge and skills generating abilities must be recognized and respected. Depending upon the cultures, some of knowledge of females and males are complementary. Both are needed for understanding a particular dimension of production or decision making. According to Mishra (1994) in many communities women are the primary natural resources managers, and that they possesses an intimate knowledge of the environment. On the other hand 1 billion young people and adults cannot read and write. Around the world, approximately 1340 million children of school age have no access to schools. Above all, it is women and girls who are disproportionately disadvantaged in Asia and Africa South of Sahara Trittin (2002). This must be addressed by governments and communities so as to achieve sustainable environmental friendly living. There are ample opportunities of using sun, water, wind, biomass and geothermal energy. The application is absolutely reasonable and no government should shy away from this task. Many poor people of the world are using renewable energy sources such as wood or dung. However, such biomass is often harvested unsustainably and burned in inefficiently (Topfer, 2004). They imply risks to the environment and to human health. Modern technologies offer much more attractive options particularly for areas where a conventional electricity grid will be built. Such approaches make sense in economic as well as environmental terms (Hauff, 2002).

In recent development of biodiversity conservation and sustainable utilization, the role of rural community is well accepted. In light of this understanding, (1) Indigenous people of any given community should be consulted and directly involved in the planning and implementation of development and environmental projects. This would ensure the integration of positive cultural attributes in the eventual execution of projects and create a sense of belonging, (2) traditional environmental conservation practices and knowledge should be documented and encouraged in order to complement modern conservation efforts. In effect, the implementation of these guidelines will greatly contribute to environmental friendly living of the rural communities. Annan (2002) cited in Trittin (2002) stated that “we have not yet fully integrated the economic, social and environmental, nor have we made enough of a break with unsustainable development we will need to display greater responsibility for ecosystem for each other and for the future generation...”. The principle of sustainable development is conserving resources so that the adults of tomorrow are able to benefit from them (Bagine *et al*, 1997; Huff, 2002).

CONCLUSIONS AND RECOMMENDATIONS

Sustainable management of biodiversity should not be restricted upon the socio-economic status of affected communities. It should go beyond this level. Level of knowledge is not sufficiently documented and the indigenous knowledge base important for biodiversity survival remains undocumented and relatively unknown. Therefore, communities and their domestic biodiversity and wild diversity have lived side by side with wildlife and have used these resources in a sustainable manner following traditional methods when their numbers were low. But this is not the case

today in most places due to population explosion and dynamic nature change in socio- economic development and change in technology threatening the biodiversity at all levels. The current low level of information exchange between countries, and between institutions resulted in duplication of efforts.

Conservation programs should take into account socio- cultural issues and economic wellbeing of the communities particularly in health, education, nutrition, financial benefits accruing from conservation, etc and should seek partnership with grassroots community groups and organizations, community participation in all aspects of research and development projects. Relevant institutions should mount interdisciplinary research; undertake documentation of IK (indigenous knowledge) packages. Relevant institutions, communities and market organizations, should develop appropriate technologies and methodologies for sustainable harvesting of biodiversity products such as non wood forest products, gums, herbal medicines, sand, etc through community participatory approaches. Modern conservation programs should incorporate traditional resources management techniques and promote the co-existence of people and wildlife scrutinize present policies on community rights, intellectual property rights and security of access to the resources bases (IBCRa, 2001). In the last ten years world communities have made considerable progress along the road towards sustainable development. This applies to the fight against hunger and poverty as well as to the prudent use of available resources for energy and drinking water. Therefore, agriculture has to feed more and more people using less and less land. This can be achieved by sustainable farming strategies using environmental technologies and inputs. If they are to catch up

economically in a relatively climate friendly way, the industrialized countries will have to cut their natural economic and financial resources are not over exploited at the expense of future generations. Awareness is growing even if very slowly, that the development of one country at the expense of others will not be able to continue for ever. Responsibility for protecting the environment for equitable distribution of goods and for sustainable policy is not only a matter for government. Consumers are also an important element in the implementation of a sustainable strategy. Achieving sustainable on global scale will only become possible by ensuring basic level of education.

Recommendations

Therefore, agriculture has to feed more and more people using less and less land to lessen the threat on biodiversity thereby the ecosystem as a whole. The notion of sustainable living and development should give emphasis to the young generation at all ranges. Imparting knowledge in order to secure sustainable education, research findings have to be made accessible to a broad audience. In sustainability development natural, economical and financial resources should not over exploit at the expense of future generations. It should give chance for the future generation will have the same opportunities to shape events as we have today.

All interventions should incorporate relevant education and acquisitions of multidisciplinary skills and enhance information exchange at regional and international, institutional levels. Business activity should be environmental friendly and successful more than only making a profit. It must be ecologically acceptable, socially beneficial and economically

profitable. There should be clear guidelines which help to achieve the goal of sustainable development interventions. Therefore, there need to streamlined, facilitation and exchange of data and research results on biodiversity including literature publications and database. Little can be achieved without an effective capacity for implementation of conservation and sustainable use. Hence, there should be training of professions who will devote their work on conservation and sustainable utilization of biodiversity at grass root level. In addition to this local communities should be capacitated towards sustainable use and conservation of biodiversity.

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