

Education and Biodiversity: An Overview

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Abstract- Biodiversity is an essential component of human development and human security. Agriculture, forestry, fishing, crops, timber and fish play an important role in national economics and employment. Biodiversity plays an important role in ensuring their food and income from natural resources. In these environments, there is a high dependency on genetic, species and ecosystem diversity to support their livelihood.

Biodiversity directly affects access to education and women's empowerment by imparting on the time taken for women to perform definite household duties, and thus the time available for education and other activities. Degradation of biological resources and subsequent non-availability of fuel, non-timber forest produce and potable water results in significant time being spent collection these resources every day. Thus, aspects of biodiversity are of direct and indirect important importance to availability of food, health, nutrition, house-hold development, income generation and vulnerability.

Indexed Terms- Biodiversity, climate change, Education

I. INTRODUCTION

Biodiversity is the variation of all life form on earth. It is a measure of the variety of organisms present in different ecosystems. The term Biodiversity is used by Rio de Janerio Convention to refer to all aspects of variability evident within the living world, including diversity within and between individuals, populations, species, communities, and ecosystems. In the simplest sense, biodiversity may be defined as the sum total of species richness, i.e., the number of species of plants, animals and microorganisms occurring in a given region, country, continent of the entire globe. Broadly speaking, the term biodiversity includes genetic diversity, species diversity, ecosystem diversity and habitat diversity.

Biodiversity refers to the variety of all forms of life on earth, including the different plants, animals, micro-organisms, the genes they contain and the ecosystem they form. It is considered at three main levels including species diversity, genetic diversity and ecosystem diversity within an area, biome or planet. Terrestrial biodiversity tends to be highest near equator, which seems to be result of warm climate and high primary productivity. While the extent of variability is species- and population-dependent, most species possess an immense pool of intrinsic variability. This variation results in an army of individuals with differential fitness potential depending on the local environment, and it is this army upon which natural selection operates. However, the critical issue is not just the existence of genetically unique individuals but rather variants whose genotypes are differentially sensitive to the environmental stress. In reality, only a small percentage of the variation within most populations challenged by a novel stress influences the fitness of those individuals. Relative to the variety of habitats, biotic communities and ecological processes in the biosphere, biodiversity is vital in a number of ways including promoting the aesthetic value of the natural environment, contribution to our material well-being through utilitarian values, maintaining the integrity of the environment through; maintaining carbondioxide-oxygen ratio, regulation of biochemical cycles, absorption and breakdown of pollutants and waste materials through decomposition, determination and regulation of the natural world climate, protective services, e.g. by acting as wind breaks and acting as indicators of environmental changes. Biodiversity is not evenly distributed on earth it is richest in the tropics. Marine biodiversity tends to be highest along coasts in the western pacific, where sea surface temperature is highest and in the mid latitudinal band in all oceans. Biodiversity generally tends to cluster in hotspots, and has been increasing through time but will likely to slow in the future.

Traditional knowledge is a dynamic knowledge system ever changing, adapting, expanding and adjusting to the local situation and it has close links with the culture, civilization and religious practices of the communities. It covers all spheres of human activity such as art, architecture, agriculture, education, literature, environment and all other human vocations. Genetic resources constitute an integral component of biological diversity. They provide the basis not only for the continuous evolution and maintenance of life supporting system on earth, but also for the sustainable economic, scientific, technological, cultural and spiritual development of mankind. The prospects of exploring biodiversity for new medicines, foods, crops, insecticides, pesticides and other commercially valuable genetic and biological products and process are booming, and it is due to rapid development in biotechnology- particularly genomics, proteomics, enzymatic and transgenic technologies- herbal technology and this exploration of biodiversity for commercially valuable genetic and biochemical resources is termed as “bioprospecting”- a concept pioneered by Thomas T. Eisner as “Chemical prospecting” (Eisner 1989, Reid *et.al* 1993). The advancements in biotechnology has further redefined the overall scope and utility of bioprospecting to encompass all relevant activities related to systematic search for genes, natural compounds, designs and whole organism in wildlife with a potential for product development by biological observation and biophysical, biochemical and genetic methods without disruption to nature (Mateo *et.al*.2001). in short, bioprospecting involves investigation of genetic resources or biochemicals for new chemical leads (Laird and Ten Kate 2002) and includes three major areas such as “chemical prospecting”, “gene prospecting” and “bionic prospecting” (Mateo *et.al*.2001).

India is one among the 12 mega gene centers of the world. The Indian gene center is considered the centre of origin and domestication of as many as 356 major and minor crop plants species and as many 326 wild relatives of crop plants. India has always been playing a proactive role in the development and implementation of several global, international, regional and national policies and programs related to environment, traditional knowledge are two capital resources of India and they form the prime focus of all

the sectorial and cross sectorial programs centered on sustainable development. Throughout the history, biodiversity has been the commons of local communities, with both resources and knowledge being freely exchanged. Less than a year after CBD came into force, the World Trade Organization (WTO) in 1994 was established with a different agenda. The convection is founded on the principle that the local communities are dependent on biodiversity and should continue to benefit from it. The WTO administers a global trading system, much of which is founded on the private monopoly rights of transnational corporations over biodiversity. Thus, we observe a paradigm shift in the world view on biodiversity and its utilization in the 21st Century.

Despite the benefits from biodiversity, today’s threats to species and ecosystems are the greatest recorded in recent history and virtually all of them are caused by human mismanagement of biological resources often stimulated by misguided economic policies, pollution and faulty institutions in-addition to climate change. The climate change has a huge impact on biodiversity (Prakash and Srivastava, 2019). The biodiversity conservation is required for sustainable development and survival of plants and animals because biodiversity is the foundation of human life (Verma and Prakash, 2020). Overall, climate change could make it more difficult to grow crops, raise animals, and catch fish in the same ways and same places as we have done in the past (Prakash, 2014). When challenged with any environmental stress, plant populations can exhibit four different responses. The first and most common is one in which the population exhibits no response because the individuals are resistant to the environmental stress. The second and most severe case is the situation in which the population is extremely sensitive, resulting in mortality of all individuals and local extinction. In the remaining two categories of response, individuals within the population are affected by the stress, but the mechanism of response and the genetic consequences differ. In the third response category, the stress is physiologically accommodated, and growth and reproductive success of the individuals are unaffected (Physiological accommodation). In the fourth category, the stress differentially affects members of the population, with some individuals exhibiting better growth and reproductive success due to genetically

determined traits. Over several generations, this latter situation results in the progressive elimination of sensitive individuals and a shift in the genetic structure of the population towards greater resistance (microevolution). The other prerequisite to microevolution is the presence of an environmental stress that effectively selects for alleles conferring resistance. For stresses that are intermediate-to-low in intensity and prolonged in exposure duration (i.e., chronic stress), the most likely responses are physiological accommodation and/or microevolution, with only the latter affecting biodiversity. Throughout a species' distribution, a mosaic of different environments exists such that the ecological factors prevalent in one location may not be significant in another. With respect to the species, genotypic variation in morphology, physiology, and biochemistry is pervasive. The result is predictable: in any given locality, natural selection favors organisms possessing heritable traits maximizing fitness to the unique ecology of the local environment. Conspecific populations thriving in other areas possess different assemblages of habitat-specific traits. The pattern that emerges over time is a non-random array of genotypes throughout the species' distribution reflecting, in part, variation in the environment. The species' gene pool in any given generation is structured into pockets of locally attuned genetic variation. The evolution of population resistance to any environmental stress depends on two factors: (1) the availability of genetically determined, plant-to-plant variation in response to the stress and (2) natural selection for resistance. The interplay between these two processes dictates not only the speed with which populations can evolve resistance but the limits to what natural selection can achieve. The salient point is that evolution at the level of populations can be substantial, but there are significant limits to what evolution can achieve (Bradshaw and McNeilly 1991a).

Women are significant actors in natural resources management and they are major contributors to environment rehabilitation and conservation. Women have not only knowledge about the environment but they protect and care the environment. Women being primarily responsible for domestic and household management interact more intensively with both the natural and built environment. This study was carried out on role of women in environmental security in

India with the objective to socio-economic status of women, assess the participation level of women in activities related to the environment such as household, health and hygiene, water and air, awareness and adoption level of available related technologies, identify the constraints and hurdles in adopting related modern technologies and role of home scientists in solving the remaining constraints and hurdles in adopting develop practices. These household activities are eco-friendly in nature and protect the environment. Thus, biodiversity is a measure of the health of ecosystems and is the foundation of ecosystem services to which human wellbeing is intimately linked (Prakash and Verma, 2019).

Environmental degradation is a result of the dynamic interplay of socio-economic, industrial and technological activities. Environmental changes may be driven by many factors including economic growth, population growth, urbanization, intensification of agriculture, rising energy use and transportation, Poverty still remains a problem at the root of several environmental problems. Environmental problems in India arise as negative effects of developmental process and from conditions of poverty or under development. Thus, there is an urgent need for conserving our environment via conserving our biodiversity. For this purpose, new and aggressive projects have to come-up at the end of Government and NGO's end. Even the awareness of the severity of the problem at school level will also bring fruitful effects in due course of time.

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