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Factors Responsible for changing trends of Bio-diversity in Eastern Ghats of Tamil Nadu

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ABSTRACT

The present research study was conducted to find out the factors responsible for changing trends in bio-diversity in Eastern Ghats of Tamil Nadu. Among the thirty two districts of Tamil Nadu, Salem and Thiruvannamalai district were purposively selected. Since, the tribal population were found to be high. The study was conducted in two blocks namely Pethanaickenpalayam in Salem district and Jawadhu hills in Thiruvannamalai district respectively. Totally 182 tribal respondents were selected based on proportionate random sampling method. The data was collected through personal interview method by using the well-structured interview schedule. The statistical method percentage analysis was used to analyse the collected data. Findings were meaningfully interpreted and relevant conclusions were drawn. The results shows that introduction of new plant varieties (97.80 per cent), deforestation (96.15 per cent), erratic variation of rainfall (94.50 per cent) and application of chemical fertilizer (91.75 per cent) are the major factor responsible for changing trends of bio-diversity in the study area.

Key words: *Factors, Bio-diversity, Eastern Ghats, Social Structure, Society development and Environmental factors.*

Introduction

Biodiversity includes the number of different organisms and their relative frequencies in an ecosystem. It also reflects the organization of organisms at different levels. Biodiversity holds ecological and economic significance, it provides us with nourishment, housing, fuel, clothing and several other resources and also extracts monetary benefits through tourism. Therefore, it is very important to have a good knowledge of biodiversity for a sustainable livelihood. We value biodiversity for many reasons, some utilitarian, some intrinsic. This means we value biodiversity both for what it provides to humans, and for the value it has in its own right. Utilitarian values include the many basic needs humans obtain from biodiversity such as food, fuel, shelter, and medicine. Further, ecosystems provide crucial services such as pollination, seed dispersal, climate regulation, water purification, nutrient cycling, and control of agricultural pests and its maintenance are very important for sustaining life on earth.

India is one of the most diverse nations in the world. It ranks ninth in terms of plant species richness. Totally, twenty five biodiversity hotspots are found in India. It is the origin of important crop species such as pigeon pea, eggplant, cucumber, cotton and sesame a centre of various domesticated species such as millets, cereals, legumes, vegetables, medicinal and aromatic crops, etc.

Environmental Information System (ENVIS) report (2021)Tamil Nadu is endowed with a rich treasure trove of biodiversity in its forest mainly found in Western and Eastern Ghats. As Tamil Nadu is

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rich in biodiversity with an area of 1, 30,058 Sq. km, the state accounts for about four per cent of the country's total area. Nearly one-third of the total flora in India is found in TN, its species and genetic diversity richer than neighbouring states. 307.85 Sq. km or 1. 36 per cent of total forest area of the state has been brought under national parks 2,602.07 Sq. km of the state declared as wildlife sanctuaries, there are two biosphere reserves in the Nilgris and in the Gulf of Mannar.

Cinthia (2009) stated that the tribal's are the main custodians of the rich bio diverse heritage for over 4000 years. The prevalent diverse cultural and social groups with varying food habits from region to region have sustained diverse food crops too systematically. However, in the recent few decades there has been tremendous strain on our bio wealth.

The risk has been further accentuated with the introduction of hybrid varieties with the practice of mono crop cultivation besides use of large scale chemical inputs. Thus, one can attribute the loss of several traditional or coarse crop species such as vegetables, fruits and food crops alike to the onset of green revolution.

There has been a large scale extinction of very useful species like medicinal plants, food crops, animal species, birds, farm-friendly insects' microorganism, forest species etc. among the tribes. The forests are threatened by large scale felling, encroachments, submergence due to hydro power/irrigation projects, overdrawing or plundering of natural resources by industries, pollution of environment, mining, quarrying etc. Application of chemical inputs such as insecticides, pesticides and manure etc. in cultivation have led to loss of several species in the soil such as beneficial worms, nematodes, predators, parasites, birds, micro-organisms etc.

With this background the study entitled 'Factors responsible for changing trends of bio-diversity in Eastern Ghats of Tamil Nadu' was taken up and the results were further enumerated in the results and discussion part to answer the question that

1. What are all the factors are responsible for changing the trends of bio-diversity in Eastern Ghats?

Based on the question, the hypothesis framed were:

Null hypothesis: There is no significant effect of different factors on bio-diversity conservation

Alternate hypothesis: There is a significant effect of different factors on bio-diversity conservation

Methodology

The study was carried out in Eastern Ghats of Tamil Nadu by using the Ex-post facto research design. Among the thirty two districts, Salem and Thiruvannamalai district was selected purposively, since tribal population was high. Pethanaickenpalayam block of Salem district and Jawadhu hills block of Salem district was purposively selected based on higher population. The respondents were selected from the four villages namely Chinna kalrayan vadaku and Periya kalrayan keelnadu villages of Salem district and Kovilur and Nammiyampattu villages of Thiruvannamalai district were purposively selected. From the villages 0.5 per cent of the population was selected as a sample for the study. Totally, 182 samples were derived from the four villages by using the proportionate random sampling method. Data was collected through personal interview method by using the well-structured interview schedule to the tribal respondents. Percentage analysis was used for analysing the data. After contacting the respondents the collected data were subjected to statistical analysis for get better interpretations.

Results and Discussion

Factors responsible for changing trends of bio-diversity in tribal areas

The major causes and reasons for changing trends of bio-diversity are habitat changes, degradation of land, pollution of air and water, application of plant production and protection chemicals, introduction of market oriented and exotic crop varieties and all these factors are coexistence with higher human population. Changing bio-diversity in forest areas can exist by changes in social structure, development of society, changing agricultural patterns and environmental factors. By reviewing the literature related to bio-diversity degradation important causes and reasons for changing trends of bio-diversity were enumerated below:

Social structure

From the Table 1, it was found that majority (87.36 per cent) of the tribal respondents expressed that habitat destruction was the main causing factor among the other social factors followed by land

Table 1. Distribution of respondents based on causes and reasons for changing trends of bio-diversity in tribal areas. (n=182)

S. No.	Changing Factors	No.	Percentage
I. Social Structure			
1.	Habitat destruction	159	87.36
2.	Over exploitation of resources	95	52.19
3.	Land fragmentation	152	83.51
4.	Population growth	144	79.12
II. Development of Society			
1.	Infrastructure development	152	83.51
2.	Global education system	75	46.70
3.	Modernization of health care system	156	85.71
4.	Government development programmes	154	84.61
5.	Modernization of tribal areas	86	47.25
III. Agricultural Methods			
1.	Introduction of exotic plants	178	97.80
2.	Application of chemical fertilizers	167	91.75
3.	Utilization of plant protection chemicals	128	70.32
4.	Mono culture	95	52.19
5.	Changing towards market oriented crops	158	86.81
IV. Environmental Factors			
1.	Deforestation	175	96.15
2.	Pollution and contamination	165	90.65
3.	Changes in rainfall pattern	172	94.50
4.	Landslides and erosion	35	19.23
5.	Siltation of water bodies	95	52.19

fragmentation (79.12 per cent), population growth (79.12 per cent) and over exploitation of resources (52.19 per cent). Increasing the family needs in every family in the study area which results in habitat destruction and land fragmentation to satisfy the family needs. The increasing demand, stemmed from the increased population, such items are being exploited legally and illegally, on a highly unsustainable manner, which depletes their source species and degrade their habitats.

Development of society

Regarding societal development, majority (85.71 percent) of the tribal respondents agreed with modernization of health care system followed by government development programmes (84.61 per cent), infrastructure development (83.51 per cent) and less than fifty per cent of the respondents indicated that modernization of tribal areas (47.25 per cent) and global education system (46.70 per cent). Development of tribal society increases the livelihood and infrastructural facilities affects the bio-diversity. The infrastructural facility such as roads, power transmission lines and canal banks may affect the forest continuity. Modernization of health care system in the hilly tribal area which excludes the traditional method of health care system which leads to neglecting the medicinal plants becomes insecure to the particular plant species.

Agricultural methods

Regarding agricultural methods vast majority (97.80 per cent) of the tribal respondents had started growing the exotic plants in their agricultural land for the increased income followed by application of chemical fertilizer (91.75 per cent), changing towards market oriented crops (86.81 per cent), utilization of plant protection chemicals (70.32 per cent) and mono culture (52.19 per cent). The tribal people in the study area of selected villages in two districts started cultivating the pepper with silver oak tree because the pepper was trained with the silver oak for doubling their income. Practicing of mono cropping leads to reduction in soil fertility as well as productivity which induces the tribal farmers for more application of fertilizers. In Salem district the tribal people,cultivating the tapioca, vegetables, pepper and coffee plantations instead of the traditional crops like horse gram, little millet and foxtail millets whereas in Thiruvannamalai district,concern tribal

people started cultivating cotton, cucumber, fruits like mango and pepper instead of traditional crops like little millet and foxtail millet and horse gram. Technical guidance given by state department of agriculture, horticulture, KVK's, TNAU research stations and NGO's the influencing factor for introduction of new cropping pattern in the study area.

Environmental factors

In regard to environmental factors vast majority (96.15 per cent) of the respondents stated that deforestation is the main factor which degrade the biodiversity followed by erratic rainfall pattern (94.50 per cent), pollution and contamination (90.65 per cent), siltation of water bodies (52.19 per cent) and less than one fifth (19.23 per cent) of the tribal respondents said that landslides is also one of the causing factor for degradation of bio-diversity. People in large numbers are allowed to go into both protected and other natural forest areas for recreation, carrying with them various items and discarding the packing items, carry bags are enhances the degradation of environment.Tourists also take away with them flowers and other plant parts, seedlings seeds, animal parts, etc. affecting the regeneration of various plant and animal species. Such influxes of people also become a disturbance factor to the wild fauna population, which require undisturbed forest areas for their free movement, feeding, breeding and multiplication. With regard to landslides and erosion both the districts shows low vulnerability it occurs only with the high rain fall during that time some plant species are threatened. The results are in line with the findings of Rajasekaran (2013).

Conclusion

The gradual decline in bio-diversity has many consequences for human activities. Disappearance of pollinating insects makes the complications in agricultural production will leads to breakage of food chains. Protecting the bio-diversity from the different factors is a very complex task because most of the human actions have a negative effect on eco system. This study reveals that habitat destruction, land fragmentation, modernization of health care system, introduction of exotic plant varieties, higher application of plant chemicals and increased deforestation are the major factors for changing trends in bio-diversity. These factors can be revamped by limiting deforestation, preservation of forest areas and grow rich traditional varieties in the nature's intricate laboratory as there is no other simple and cheaper alternative to it. So threat to biodiversity can be moderated if not fully prevented only when the communities maintain diverse cropping pattern, revive and grow traditional crops, continue diverse food habits, avoid chemical inputs in cultivation, use bio-friendly farm practices and avoid mono and plantation cropping in the study area.

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