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Mathematics of Ecosystem

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ABSTRACT: Ecosystem is a dynamic unit of nature. All the biotic components of any ecosystem are inter-related. Biotic components are the plants and animals population or species. Decreasing number of any species of any ecosystem is the loss of biodiversity and it is the major problem of present time. Each species takes the energy in the form of food from other species. In this way food chains and food web are formed in every ecosystem. In any food chain or food web several species may remain in a group. These groups form different trophic levels in ecosystem. Charls Elton in 1927 express the relation of each trophic level in sequence. This arrangement gives the shape of pyramids. The relation of trophic levels can be expressed by three ways. One is according to number, second is biomass and third is quantity of energy in each trophic level. In this way straight and inverted pyramids of numbers and biomass are formed. The pyramid of energy is always straight. Any ecosystem may be static when the number and biomass of components of each trophic level of ecological pyramid remain near about constant. The variation in number and biomass of any level affects the number and biomass of other level. In presents time when biodiversity loss is increasing the other species of ecosystem may be lost. To prevent this loss there must be near about constant number of individuals in each trophic level. So the ideal condition of ecosystem may remain.

Key words: Ecosystem, Biodiversity, Ecological pyramids, Trophic level.

I. INTRODUCTION

Biodiversity loss in any ecosystem is a burning problem. Loss of any species may alter the whole ecosystem. In this paper an attempt is made to know the reasons which are responsible to affect some trophic levels of ecological pyramids and this trophic level may alter the whole ecosystem.

II. MATERIAL AND METHOD

This is a review work. Many scientific studies shows the inter relationship of different populations. In any ecological pyramid the basic or first trophic level is occupied by producers. Most of the producers are rooted plants. The factors responsible to effect the first trophic level adversely may create bumping effect on whole ecosystem.

III. OBSERVATION

The human beings occupied upper most trophic level of ecological pyramids. The increasing number and activities of human beings creating a condition to decrease the number and biomass of first trophic level. As the whole earth is a large ecosystem. Earth is directly related to first trophic level because without earth, vegetation can't produce to fulfill the energy requirement of other trophic level's communities. Earth also gives space to live to all other communities of each trophic level. Increasing number of individuals in other trophic level will reduce the community of first trophic level. The imbalance in the number and biomass in each trophic level the ecosystem may not be static.

There are many reasons which are responsible to decrease the earth's area for producers i.e. the community of first trophic level and also for the community of other trophic levels expect human beings.

Increasing human population: In the second century the human population of world was about 190 million and was 7 billion in 2011. Human beings are top level population. Their increased number, lifestyle, activity etc. are the reasons which reduce earth's area to other communities. It is observed that continuous decrease in forest area, cropland area ponds, lakes etc. for house making purpose.

Increasing human needs: With the developing technologies, new things are generating. To take advantages of new things human needs are increasing. Following human needs and activities are responsible to decrease earth's area.

(i) Expansion of roads.
(ii) Increasing number of factories.
(iii) Increasing number of recreation halls, hotels etc.
(iv) Increasing number and size of railway stations and rail tracks.
(v) Increasing number and size of bus stands.
(vi) Increasing number and size of aerodromes.
(vii) Increasing Area of earth to deposit waste.
(viii) Increasing Area of earth to deposit non degradable waste like plastic and E waste. Plastic and E waste not only occupies the earth's surface but also produces horm to human as well as other population of ecosystem.
(xi) Space for schools, colleges and other institutions.
(x) Space for shops, market etc.
(xi) The top most species of ecological pyramid exerted pressure on other trophic level communities. The negative effect of above conditions on human beings also started. We observed following conditions which are harmful to human population.
(a) Natural clematis.
(b) Malnutrition.
(c) Pollution (air, water, soil) and diseases.
(d) Conflicts with other animals (intra-species war)
(e) Conflicts with other human being (interspecies war)
(f) Criminal activities.

IV. DISCUSSION

There are many studies which show the effect of species to other. Alarming increase of feral dogs in the habitats of wild ungulates causing heavy death of black bucks [3].Overgrazing is also a cause of loss of biodiversity [4]. As the human population will grow the extinction of other species will increase. About 80 percent of human's food supply comes from just 20 kinds of plants, human use at least 40000 species. Many people depend on these species for food, shelter and clothing [1].

The extinction or other species must be affect the human beings. During the last century, decreases in biodiversity have been increasingly observed. In 2007 aerman Federal environmental minister Sigmar Gabrial cited estimates that up to 30% of all species will be extinct by 2050 [2]. Of these about one eighth of known plant species are threatened with extinction [5]. Estimates reach as high as 140000 species per year [6]. This figure indicates unsustainable ecological practices. Some studies suggest that 25% of all mammal species could be extinct in 20 years. New species invasions by human can also affect the ecosystem. The number of species invasions has been on the rise at least since the beginning of the 1900s. Species are increasingly being moved by humans. In some cases the invaders are causing drastic change and damage to their new habitats.

V. CONCLUSION

Intra species competition affects the presence of other species. Human beings are knowingly or unknowingly creating problems to other species of any trophic level. Imbalance in number and biomass of any trophic level will harm to ecosystem.

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