# Why we should care for biodiversity

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IF any body asks why we care for biodiversity? The instant answer is "*biodiversity gives our plant the status of living world and gives the name as biosphere*"; and that is why we care for biodiversity. If there is no word biodiversity the earth loses its name of biosphere. These are popular words we can use to satisfy the question. But biodiversity has got its dynamics within the term biodiversity and in between the task of living and non-living factors on the earth. These intra and inter dynamics of biodiversity make us more obligatory to care for biodiversity in the field of natural balance maintenance. In addition to that, we care for biodiversity on the reasons of economic and commercial value of it. Maximization of a species population of any biological resource takes them in the state of harvest. If we can harvest any species or species product then we could make trade with that species harvest both at national and global level. If biodiversity is cared well in a country, the nation could be benefited by producing optimum harvest of its bioresources. Biodiversity then sponsors the sustenance of economic development of nation. So, we care biodiversity for two main causes for our existence in the world: a. We care for scientific/environmental reasons; and b. We care for commercial/trade reasons.

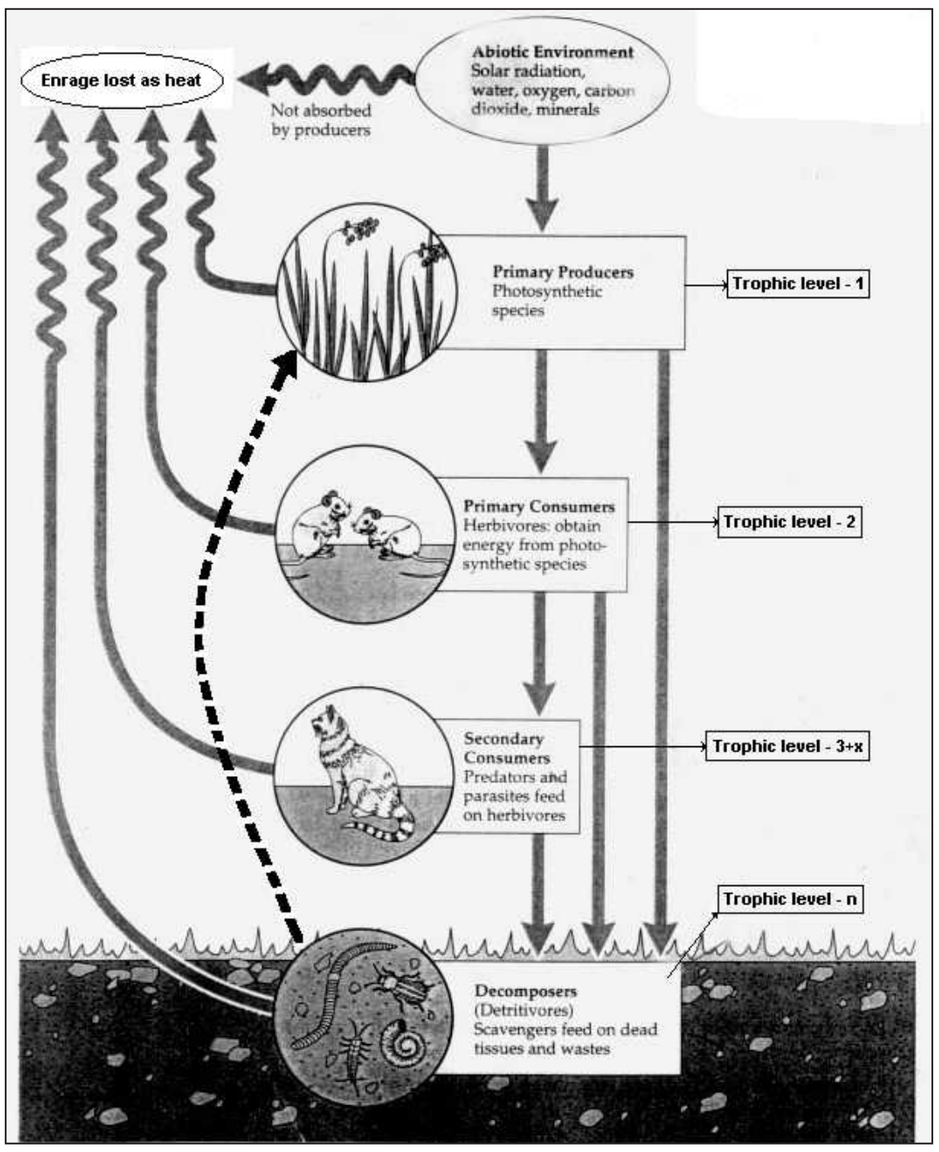
We care biodiversity for scientific/environmental reasons because it has great role in nature on the following headings: 1. Keeps the balance of biomass production in the biosphere; 2. Keeps the energy-flow in biotic form in balance in biosphere; 3. Keeps the soil fertility in balance in biosphere (eg. Keeps the proportionity of production of microbes in respective areas in the biosphere); and 4. Keeps the biotic-abiotic relations in balance (Ecosystem balance maintenance).

We care biodiversity for commercial/trade reasons because it cause the species harvest bioresource distribution availabilities under the followings headings: 1. Biodiversity and poverty; 2. Biodiversity in food security; 3. Biodiversity in production of crops; 4. Livestock and biodiversity; 5. Biodiversity in global fisheries; 6. Biodiversity and forest; 7. Wildlife and biodiversity; 8. Biodiversity and human health; 9. Road construction and biodiversity; 10. Regional approaches and biodiversity; 11. Genetic resource use and biodiversity; 12. Trade policy and biodiversity; 13. Sustainable use of Biodiversity; and 14. Tourism and biodiversity.

In my article of "Biodiversity: Striking an economic and environmental balance" dated on 31 October, 2003 I have pointed out a few aspects on the commercial and trade benefit of biodiversity in modern world. Today's discussion will be on the point 'how biodiversity awareness is necessary for the question of environmental balance maintenance in nature'. Biodiversity is total variety of life on earth (Arms, 1990). Then biodiversity deals with all variety of living organism both plants and animals. The present article focuses the importance of how the varieties of living organisms get interacted with each other and enrich the environmental sound ness. To explain this the biologists have chronologically established the pathways of energy-flow (in nature) from non-living form to organic matter and then to microbs before going again to the non-living form. So, entire living world has been divided into different trophic levels. *Trophic level is the position of an organism in the food chain, determined by the number of transfers of energy that occur between the non-living energy source and that position. Trophic levels include producers (photrsynthesizers and chemosynthesizers that convert light or chemical energy into living material) and several levels of consumers (animals eating plants, animals eating animals and eating animals).* Figure below explains the functioning of trophic levels in an ecosystem and the importance of biodiversity as a whole. Usually 4-5 trophic levels are found in an ecosystem. Among these, all plants belong to trophic level 1 and other trophic levels (2-4 or 5) are functioned with the animals as the members of the ecosystem. In each of the trophic levels the figure below shows clearly the characters and types of animals constituting the trophic level. The flow of energy is indicated by arrow sign from one trophic level to another.

Primack (1998) showed a simple model of *trophic levels* and energy pathways in an ecosystem. In this model, the author explained the *trophic levels* through a schematic diagram. He stated that biological communities are organized into trophic levels that represent ways in which energy is obtained from the environment. Here '*environment*' meant the abiotic environment (solar radiation, water, oxygen, carbon dioxide and various minerals). According to his description the statement on the trophic levels may be as below:

+ Photosynthetic species (also known as primary producers) obtain their energy directly from the sun. In terrestrial environments, higher plants, such as flowering plants, gymnosperms, and ferns, are responsible for most photosynthesis, while in aquatic environments, seaweeds, single-called algae, and cyanobacteria (blue-green algae) are the most important. All of these species use solar energy to build the organic molecules they need to live and grow. This is situation in an ecosystem trophic level-1.




**A field ecosystem showing the trophic levels, simplified energy path ways and the significance of biodiversity enrichment.**

+ Herbivores (also known as primary consumers) eat photo-synthetic species. For example, in terrestrial environments gazelles and grasshoppers eat grass, while in aquatic environments crustaceans and fish eat algae. Because much plant material, such as cellulose and lignin, is indigestible to many animal species or is simply not eaten, only a small percentage of the energy captured by photosynthetic species is actually transferred to the herbivore level. This situation is trophic level-2.

+ Carnivores (also known as secondary consumers or predators) eat other animals. Primary carnivores (e.g., foxes) eat herbivores (e.g., rabbits), while secondary carnivores (e.g., bass) eat other carnivores (e.g., frogs). Since carnivores do not catch all of their potential prey, and since many body parts of the prey are indigestible, again only a small percentage of the energy of the herbivore trophic level is transferred to the carnivore level. Carnivores usually are predators, though some combine direct predation with scavenging behavior, and others, known as omnivores, include a substantial proportion of plant foods in their diets. In general, predators are larger and stronger than the species they prey on, but they usually occur in lower densities than their prey. This is trophic level-3. In the figure trophic level 3 has been marked with 3+x, because a member of trophic level 3 may become the member of trophic level 2 (when feeds on plants) at the same time when feeds on other phytophagous animals or carnivorous animals then it could be of trophic level 4 or 5. So, trophic level could be varied in this case.

+ Parasites, pests, and disease-causing organisms form an important subclass of predators. Parasites of animals, including mosquitoes, tick, intestinal worms, protozoans, and bacteria, are small in size and do not kill their prey immediately. Plants (such as mistletoe and dodder), and insects. The effects of parasites range from imperceptibly weakening their prey to totally debilitating or even killing their prey over time. Parasites are often important in controlling the density of prey species. When prey densities are low, parasites are less able to move from one host to another, and their effects on the prey population are correspondingly weak. When prey populations are at a high density, parasites spread readily from one host individual to the next, causing an intense local infestation of the parasite and a subsequent decline in prey density. High densities of prey populations sometimes occur in zoos and small nature reserves, making these places hazardous for many endangered species. This may be trophic level- 2, 3,4 or 5. This trophic level is designated as trophic level-n. It may be the combinaiton of many trophic levels in an ecosystem. In nature, as the combination of trophic levels will be rich, sustainability of an ecosystem will be much more enriched.

+ Detritivores (also known as decomposers) are species that feed on dead plant and animal tissues and wastes, breaking down complex tissues and organic molecules. Detritivores release minerals such as nitrates and phosphates back into the environment, where they can be taken up again by plants and algae. The most important detritivores are fungi are bacteria, but a wide range of other species play a role in breaking down organic materials. For example, vultures and other scavengers tear apart and feed on dead animals, dung beetles feed on and bury animal dung, and worms break down fallen leaves and other organic matter. If detritivores were not present to release mineral nutrients by breaking down organic matter, plant growth would decline greatly. It may also be of trophic level - n.

Relationships of above these make it clear that organisms, including people, that subsist on an all-plant diet have more food available to them than do carnivores. Such considerations will become increasingly important in the future, not only for the efficient management of fisheries, but in general in the effort to maximize the yield of food for a hungry and increasingly overcrowded world.

Food chains generally consist of only three or four steps. The loss of energy at each step is so great that very little of the original energy remains in the system as usable energy after it has been incorporated successively into the bodies of organisms at four trophic levels. There are generally far more individuals at the lower trophic levels of any ecosystem than at the higher ones. Similarly, the biomass of the primary producers present in a given ecosystem is greater than that of the primary consumers, with successive trophic levels having a lower and lower biomass and correspondingly less potential energy. Larger animals characteristically are members of the higher levels; to some extent, they *must* be larger to capture enough prey to support themselves. As already said that all plants belong to trophic level 1, but no animal could be the member of the trophic level 1. The trophic level 1 can convert abiotic solar energy into biotic molecule then can store the energy in the living form - then can transfer the energy to any other trophic levels directly or indirectly through alimentation process. On the other hand, all other trophic levels in an ecosystem can do all the above steps in food chain but can not convert abiotic solar energy into biotic molecules. So, in all other trophic levels, the number species can change their position but the number of the trophic level-1 can not do it. They always remain in the state of first trophic level of an ecosystem. So, the numbers of first trophic level are designated as the producers and the members of all other trophic levels are the consumers.

In an ecosystem, enrichment of decomposers will increase the soil fertility and soil aliveness. This gives the sound micro environmental favourable conditions for producing more plants (autotrophs) in an ecosystem/habitat. Autotrophs production obviously will increase the biomass production and biotic energy holding capacity in an ecosystem. Then if the autotrophs become rich in number and variety consequently the trophic level-I (plants) will be with various organic source-oriented; and will give the maximization of other trophic levels like trophic level-II to trophic level 3+x. If trophic levels are numerous and established in an ecosystem the biogeochemicals cyclings will be sound and enough in functioning. This enrichment will make an ecosystem sound and the sound ecosystem will maintain the environment sound and healthy. Consequently, sound environment will be able to maintain the natural balance in the biosphere. And this is in being because of sustenance of biodiversity richness in the biosphere. So, we are to care biodiversity for not only scientific reasons but also for sustenance of our own race on the earth.

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