

Soil Biodiversity for Sustain Agro-ecosystem Functioning

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Introduction

In everyday life human needs are limitless and we use natural resources to fully fill our needs because of that our future generation will face many problems regarding resources and soil health is one of them. Now a days farmers use many chemical fertilizers and due to this soil health deteriorates soil micro-organisms count decreases day by day. We can save our earth through many ways but sustainability is important and easy way sustainability focuses on meeting needs of the present without compromising the ability of future generations. Sustainability reflects long term impact on human rather than short term gain.

Soil is a key factor in an agro-eco system hence soil health is important soil biodiversity helps in sustainability. Soil biodiversity refers to the relationship of soil to biodiversity and aspects of the soil that can be managed in relation to biodiversity. Soil biodiversity is the study of biological processes occurring in the soil. The living organisms in soil range from macrofauna to microfauna and contribute to improve soil structure, aeration & water infiltration. They predate on soil organisms & help to maintain biological equilibrium in soil. Mesofauna are important plant pathogens. Microfauna are important predators of bacteria and algae. Algae are photosynthetic and aquatic algae contribute to soil formation from rock. Algae also contribute to soil stability and fix atmospheric nitrogen, fungi play a role in decomposition of organisms and are responsible for many of these services like nutrient cycling, control of pests and diseases.

The activity and diversity of soil organisms are regulated by a hierarchy of abiotic and biotic factors. The main abiotic factors are climate, temperature, and moisture, soil texture, soil structure, salinity, pH. A climate conditions differ across the globe and in the same places between the seasons. Soil texture and structure also strongly influence the activity of soil biota. Soil salinity which may increase near the soil surface can also cause stress to soil microorganisms. Increased salinity may sometimes have positive effects making more organic matter available. Change in soil pH can affect the metabolism of the species in the ecosystem.

Assessment (MEA) (2005), defines " Ecosystem services are benefits people obtain from the ecosystem" It has categorized in 4 groups

- Supporting services (nutrient cycling, soil formation)
- Provisioning services (like food, fuel, fresh water)
- Regulatory services (waste purification, climate regulation)
- Cultural services

Current Threats of Soil Biodiversity

Soil Degradation:-The majority of human activities results in soil degradation which impacts the services provided by soil biodiversity soil organic matter depletion and soil erosion are influenced by inappropriate agricultural practice. The activity & diversity of soil organism are directly affected by the reduction of soil organic matter content.

Land Use Management and Climate Change:-Within rural lands biodiversity tends to decrease with increasing intensification of farming practices. Climate change is likely to have significant impacts on all services provided by soil biodiversity.

Chemical pollution and Genetically Modified Organisms:-Toxic pollutants can destabilize the population dynamics of soil organism by affecting their reproduction growth & survival. Genetically modified crops are considered as a growing source of pollution for soil organism.

Invasive Species-Exotic Species known as invasive species. Invasive species have direct & indirect impact on soil services and soil biodiversity. Biological regulator populations tend to be reduced by invasive species.