

## **PLS 317 - PLANT ECOLOGY AND FIELD COURSE**

### **LECTURE -2**

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#### **Summary**

This section will expose students to what ecosystem and what ecosystem services are. It will also teach students some ecosystem services. This section also enumerated some ecological factors that affects plant population.

#### **Outline**

At the end of the teaching students should be able to

- 1 Define ecosystem and ecosystem services
- 2 List and explain some ecosystem services
- 3 List ecological factors effecting plant population
- 4 Explain the ecological factors affecting plant population in details

#### **Ecosystem**

Ecosystem is the study of interaction among living organisms and their environment and theses network functioning as a system. An ecosystem consist of living organisms and all the abiotic factors that they interact with within certain communities.

#### **Ecosystem services**

Ecosystem services can be defined as wide range of services delivered to humanity by the natural environment. The natural environment is chiefly made up of plants communities. And the services these plant communities render that is beneficiary to man is referred to as ecosystem services. The following are some of the ecosystem services we shall be exploring in this course adopted from Constanza et al. 1997.

- 1 Gas regulation: The natural environment which consist of the plant communities regulate atmospheric chemical composition. Examples are Carbon dioxide/Oxygen balance
- 2 Climate regulation: This involves precipitation regulation and global temperature regulation. Example of this regulation is the greenhouse gas regulation.

3 Environmental disturbance regulation: This involves regulation of environmental fluctuations. This involve a process in which some agents of nature such as plants try to regulate the negative forces befallen the environment. Examples are storms protection, flood control and drought recovery.

4 Water regulation: This is regulation of flow in hydrology. Movement of water around the environment. Example is availability of water for agricultural purposes.

5 Food production: The natural environment involving the plant communities provides food not only for man and other animals. Examples are Production of fish, game, crops, nuts, fruits by hunting, gathering, and subsistence farming or fishing.

6 Raw materials: One of the ecosystem services is provision of raw materials which can be processed for other uses. Example is timber and wood production, cotton production, shoe manufacturing etc.

7 Medicine: The ecosystem also provides medicine for man and livestock. For instance so many plants are sources of synthetic medicine that are used for cure and prevention of several diseases in man and livestock.

8 Ornamental purpose: This are functions involves nature providing decorations and pet. Example is using plants for horticultural purposes in decorating places.

9 Recreation: This is nature providing recreational activities such as ecotourism.

## **Ecological factors affecting plant population**

### **1 Climate change**

Climate change affects plant population. It can either reduce population distribution of plant or increase it. Depending on how favorable the climatic condition within a certain geographical area is for certain plant species, this is what will determine whether there will be spread in the population or reduction in the population. Although currently the global trend is that climate change has not been to favorable for plant species distribution.

### **2 Human anthropogeny**

Human anthropogeny have adverse effect on plant population. Human anthropogeny is activities of man that destroys nature. This involves issues such as felling of trees, setting bushes on fire, bark harvesting for medicinal purposes etc. These activities keeps reducing the individuals of populations of plant species globally.

### 3 Presence of invasive species

Invasive plant species are unwanted plant species that are found in certain areas. They compete with native species and causes reduction in population of plant species that occur in their natural environment. They affect soil composition of an area, decline water resources available plants and man and they also decline nutrients for growth of wanted plants.

### 4 Pest and diseases

Pest and diseases decline plant population. When pest attack plant species they decline their population. Some pest have plant specificity when it comes attack. They only attack some certain plant species. When this is rampant, then individual of plant species start dieing.

### 5 Grazing

Animal grazing removes plant cover, destroy soils and can even cause habitat fragmentation. Overgrazing in certain areas reduces plant population.

### 6 Reproductive failure

In some plant species reproductive failure occurs. And this greatly reduce their population because of low reproductive capacity. For instance lack of pollinators sometimes does not allow some plants to reproduce effectively, while destruction of plant suckers also prevent asexual reproduction in some plants.

### 7 Edaphic factor

Edaphic factor is about the nature of the soil. This is also a factor that affects plants population. Certain soil promote plant population while some decline plant population. Soil is a medium where nutrients and water are being taken up by plants. When soil also transform to another type of soil due to some other factors such as human impact, climate change etc, they may also not support plant growth anymore and the results into reduction of plant species.