S.O.S in Pharmaceutical Sciences, Jiwaji University Gwalior .

Second Theory Lecture

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INTRODUCTION

- Our environment provides us with a variety of goods and services necessary for our day to day lives. These **natural resources include, air, water,** soil, minerals, along with the climate and solar energy, which form the non-living or **'abiotic'** part of nature. The **'biotic' or living parts** of nature consists of plants and animals, including microbes. Plants and animals can only survive as communities of different organisms, all closely linked to each in their own **habitat, and** requiring specific abiotic conditions. Thus, forests, grasslands, deserts, mountains, rivers, lakes and the marine environment all form habitats for specialised communities of plants and animals to live in. Interactions between the abiotic aspects of nature and specific living organisms together form **ecosystems of various types.**
- Many of these living organisms are used as our food resources. Others are linked to our food less directly, such as pollinators and dispersers of plants, soil animals like worms, which recycle nutrients for plant growth, and fungi and termites that break up dead plant material so that micro-organisms can act on the detritus to reform soil nutrients.

History of our global environment

About ten thousand years ago, when mankind changed from a hunter-gatherer, living in wilderness areas such as forests and grasslands, into an agriculturalist and pastoralist, we began to change the environment to suit our own requirements. As our ability to grow food and use domestic animals grew, these ‘natural’ ecosystems were developed into agricultural land. Most traditional agriculturists depended extensively on rain, streams and rivers for water. Later they began to use wells to tap underground water sources and to impound water and created irrigated land by building dams. Recently we began to use fertilizers and pesticides to further boost the production of food from the same amount of land.

However we now realize that all this has led to several undesirable changes in our environment. Mankind has been overusing and depleting natural resources. The over-intensive use of land has been found to exhaust the capability of the ecosystem to support the growing demands of more and more people, all requiring more intensive use of resources. Industrial growth, urbanisation, population growth and the enormous increase in the use of consumer goods, have all put further stresses on the environment. They create great quantities of solid waste. Pollution of air, water and soil have begun to seriously affect human health.

Changes in land and resource use

During the last 100 years, a better health care delivery system and an improved nutritional status has led to rapid population growth, especially in the developing countries. This phenomenal rise in human numbers has, in the recent past, placed great demands on the earth's natural resources. Large stretches of land such as forests, grasslands and wetlands have been converted into intensive agriculture. Land has been taken for industry andthe urban sectors. These changes have broughtabout dramatic alterations in land-use patternsand rapid disappearance of valuable natural ecosystems.

The need for more water, more food, more energy, more consumer goods, is not onlythe result of a greater population, but also the

result of over-utilization of resources by peoplefrom the more affluent societies, and the affluent sections of our own.

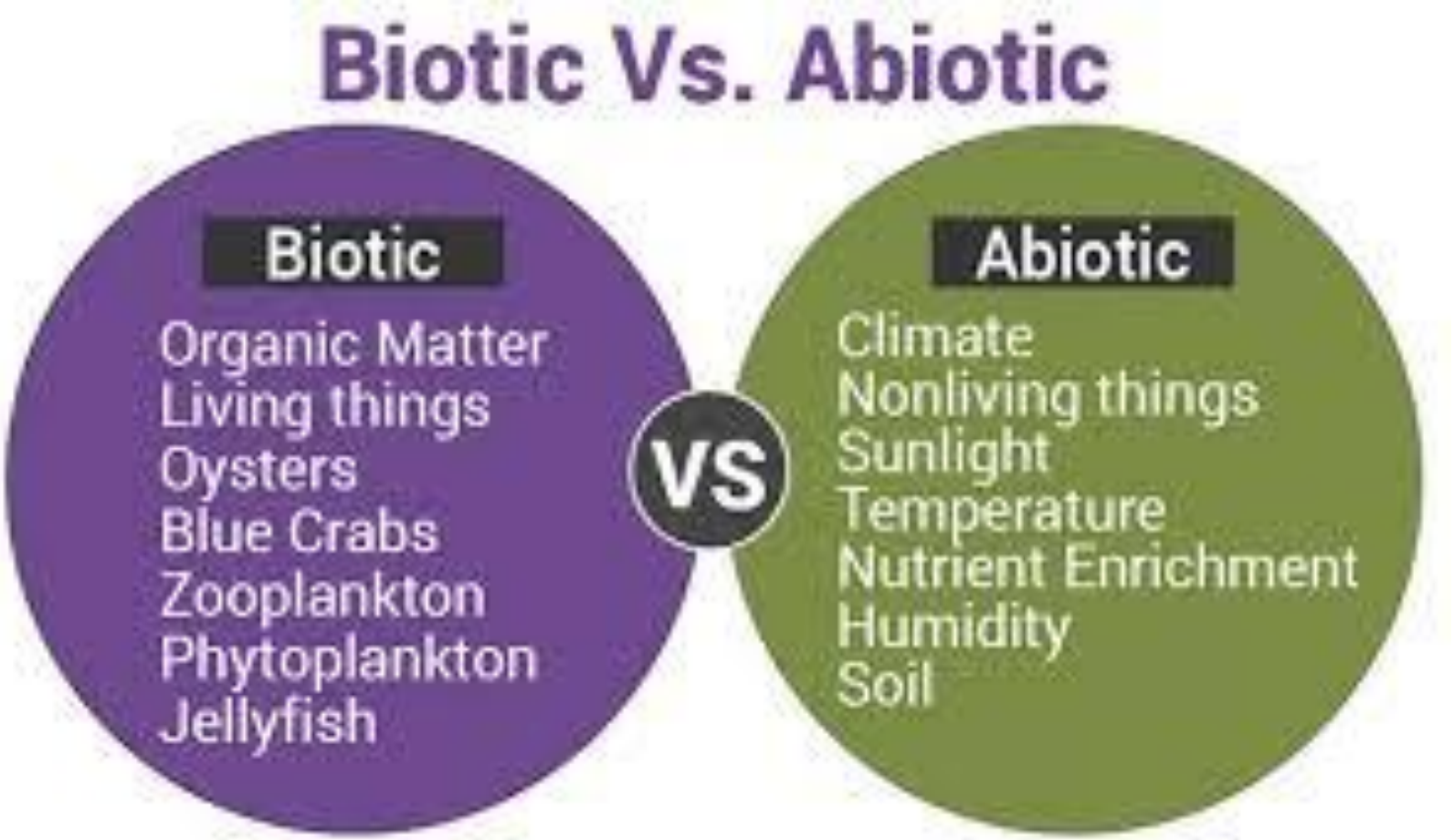
Definition of Biotic Factors

- The **main features** which differentiate the biotic with that of abiotic factors are: they respond to the stimuli, they require energy to work, they grow and develop, they contain hereditary material like DNA (Deoxyribose nucleic acid) which are transfer from one generation to another, as well they reproduce and have the capability to give rise to the young ones.

Definition of Abiotic Factors

- The abiotic factor is also known as '**environmental factor**'. Abiotic factors and biotic factors covers the almost entire biosphere, and it is the sum covering all ecosystems. The only difference between abiotic and biotic is that abiotic factors comprise of the factors like pH, temperature, climate, humidity, soil, water, minerals, gases, light, wind, etc

Biotic and Abiotic Natural Resources



Natural Resources

- **Natural resources** are useful raw materials that we get from the Earth. They occur naturally, which means that humans cannot make natural resources. Instead, we use and modify natural resources in ways that are beneficial to us. The materials used in human-made objects are natural resources. Some examples of natural resources and the ways we can use them are:
- Natural ResourceProducts or ServicesAirWind energy, tiresAnimalsFoods (milk, cheese, steak, bacon) and clothing (wool sweaters, silk shirts, leather belts)CoalElectricityMineralsCoins, wire, steel, aluminum cans, jewelryNatural gasElectricity, heatingOilElectricity, fuel for cars and airplanes, plasticPlantsWood, paper, cotton clothing, fruits, vegetablesSunlightSolar power, photosynthesisWaterHydroelectric energy, drinking, cleaning

What are these resources on the Earth

- These are the land, the water and the air. The outer crust of the Earth is called the lithosphere. Water covers 75% of the Earth's surface. It is also found underground. These comprise the hydrosphere. The air that covers the whole of the Earth like a blanket, is called the atmosphere. Living things are found where these three exist. This life-supporting zone of the Earth where the atmosphere, the hydrosphere and the lithosphere interact and make life possible, is known as the biosphere. Living things constitute the biotic component of the biosphere. The air, the water and the soil form the non-living or abiotic component of the biosphere. Let us study these abiotic components in detail in order to understand their role in sustaining life on Earth