Hello everyone I am Miss Janice Rodrigues, assistant professor

In Dhempe College of Arts and Science Miramar, Goa.

This module is for first years Bachelor of Science subject

botany. People code is BoG101 paper. Title is environmental biotechnology.

This is unit 3.

Microbiology of wastewater treatment module name Arabic

process. Oxidation pond and

oxidation ditch. Module number is 11.

In this module.

We will be dealing with oxidation pond,

and oxidation ditches.

By the end of this module, you will be able to state the

principle of oxidation pond, an oxidation ditch. Explain they

are working and also state their advantages and disadvantages.

Oxidation pond is also known as stabilizer pond.

I'm sorry.

Oxidation points are also called as stabilization points.

It is constructed deep in the ground and hence are made of

urban material. Sunlight.

And microorganisms, like bacteria, fungi and algae formed

the major components of oxidation ponds. The picture shown in the slide is a picture of oxidation pond.

Oxidation point is based on the principle that cooperative interaction between algae, bacteria, and fungi converts the biodegradable organic matter into harmless compounds. The microorganisms will use oxygen released by the algae to oxidize the biodegradable organic matter. The algae in turn will utilize the inorganic compounds released during oxidation process. Let us see how it all works. The raw wastewater will enter the oxidation pond. The bacteria which is present in the oxidation pond will act on the organic waste and converted to carbon dioxide, ammonia, and nitrates. The algae will consume these products. Also they will photosynthesise and release oxygen in the process. This oxygen is in turn used by the bacteria. To breakdown. More organic waste material from the wastewater. The erosion in this process is also done by the wind action. After sufficient retention time. The effluent is let out for further treatment. The advantages and disadvantages of oxidation ponds. Coming to the advantages, oxidation points are easy to construct. Behave a low maintenance cost.

It is very easy to handle.

They are also capable of handling wearing waste water. That is, they can handle industrial as well as domestic wastewater. Oxidation ponds can reduce the BOD that is biological oxygen demand upto 90% naturally. It has a few disadvantages as well. That is, it requires a large land area as we had first seen in the picture of oxidation pond. Sometimes it may also give a foul smell. And this can also lead. Two breeding of mosquitoes. Having been constructed in the ground itself. The wastewater that is the effluent may seep into the groundwater and as a result, it may cause the pollution of groundwater. Having seen about oxidation ponds, let us move on to oxidation ditch. This is a picture of oxidation ditch. Oxidation ditch is an extended aeration system. It is constructed in a large Oval shaped tank which resembles a racing track. Oxidation ditch is based on the principle that waste water is brought in contact with the aerobic microbes in the ditch.

Retained within it for sufficient amount of time.

In an aerobic condition.

The sludge from the waste water is separated and

the water is then proceded for further treatment.

Let us start with the working of oxidation ditch.

The wastewater. Enters the system through the inlet.

Being an aerobic process here, 2 aeration is done by

aerators or surface rotors.

The microbes act on the organic matter present in the wastewater.

After sufficient retention time, the sludge that is formed is

removed. And the effluent is sent for further treatment.

Now, oxidation dishes are of two types.

One which consists of a secondary clarifier. And the other one which does not consist of a secondary clarifier.

The oxidation ditch would consist of a secondary

clarifier is known as continuous flow type.

The second one, which does not consist of a secondary clarifier

is called as the intermittent flow type. Let us see each of these working.

Working of continuous flow type.

The wastewater enters the system through the bar screen.

It is important to note that this wastewater can either come

from the pre treatment of water.

Or it can also be raw sewage.

In the oxidation ditch, the aerators carry out the aeration. After sufficient retention time, The wastewater is then transferred to secondary clarifier. In the second clarifier, the sludge is separated in. The effluent is sent for further treatment. It is important to note that it is the oxidation ditch where the microorganisms actually breakdown the organic waste matter from the wastewater. In intermittent flow type you will notice that there is no secondary clarifier that is provided here to. The water will enter. Through the bar screen. Into the oxidation ditch, the aerators will carry out the aeration. After sufficient time. The working of the aerators is stopped. The water is held in the oxidation ditch. In the oxidation ditch itself will facilitate the settling of the sludge. The effluent that is separated from the sludge will be then carried forward and proceeded for secondary. The water that is treated will be carried forward for further treatment.

Coming to the advantages and disadvantages.

The advantages include.

Oxidation ditch can remove more than 90% of the

suspended solids.

It can remove more than 98% of

the. Biological oxygen demand.

Also, we have seen that no primary treatment is required

for oxidation ditch.

Disadvantages include the power consumption of aerators is high.

Skilled labour is required for this process. These are my references. Thank you.