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(ENVIRONMENTAL SCIENCE)

Q. Eutrophication is a phenomena caused by the abnormal growth of algae in water body. What are the reasons of algal bloom and how can this phenomenon be controlled?

Ans

(1) Eutrophication

It is an excessive and abnormal plant and algal growth in the water bodies due to increased levels of growth factors.

(2) TYPES OF EUTROFICATION

2.1) Natural Eutrophication

It is caused naturally. It is relatively slower, requires months and years to happen.

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2.2) Cultural Eutrophication

It is instigated by human activities.

It is faster and requires weeks and even days to happen.

3) CAUSES OF EUTROFICATION ; Reasons of Algal bloom

3.1) Agricultural Runoff

Agrochemicals such as fertilizers used in agricultural practices contain excessive nitrogen and phosphorous.

When the rains and irrigation wash these nutrients from fields into water bodies, they cause eutrophication.

3.2) Waste Water Discharge

The untreated sewage from domestic sources contains nitrogen and phosphorous from human waste and detergents. When it is discharged into nearby water, it causes algal bloom.

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3.3

Industrial Sources

The treated and untreated waste from industries like food industry, fertilizer industry contains growth factors. When this liquid waste is discharged into water bodies, it causes algal growth.

3.4)

Aqua culture

Fish farms also cause algal bloom when they release excessive nitrogen and phosphorous into water bodies.

4)

PROCESS OF EUTROFICATION

i)

The fertilizer from croplands when runoff by rain into water bodies causes algal growth.

ii)

The excessive algal growth causes disturbance in the penetration of solar heat into the water body.

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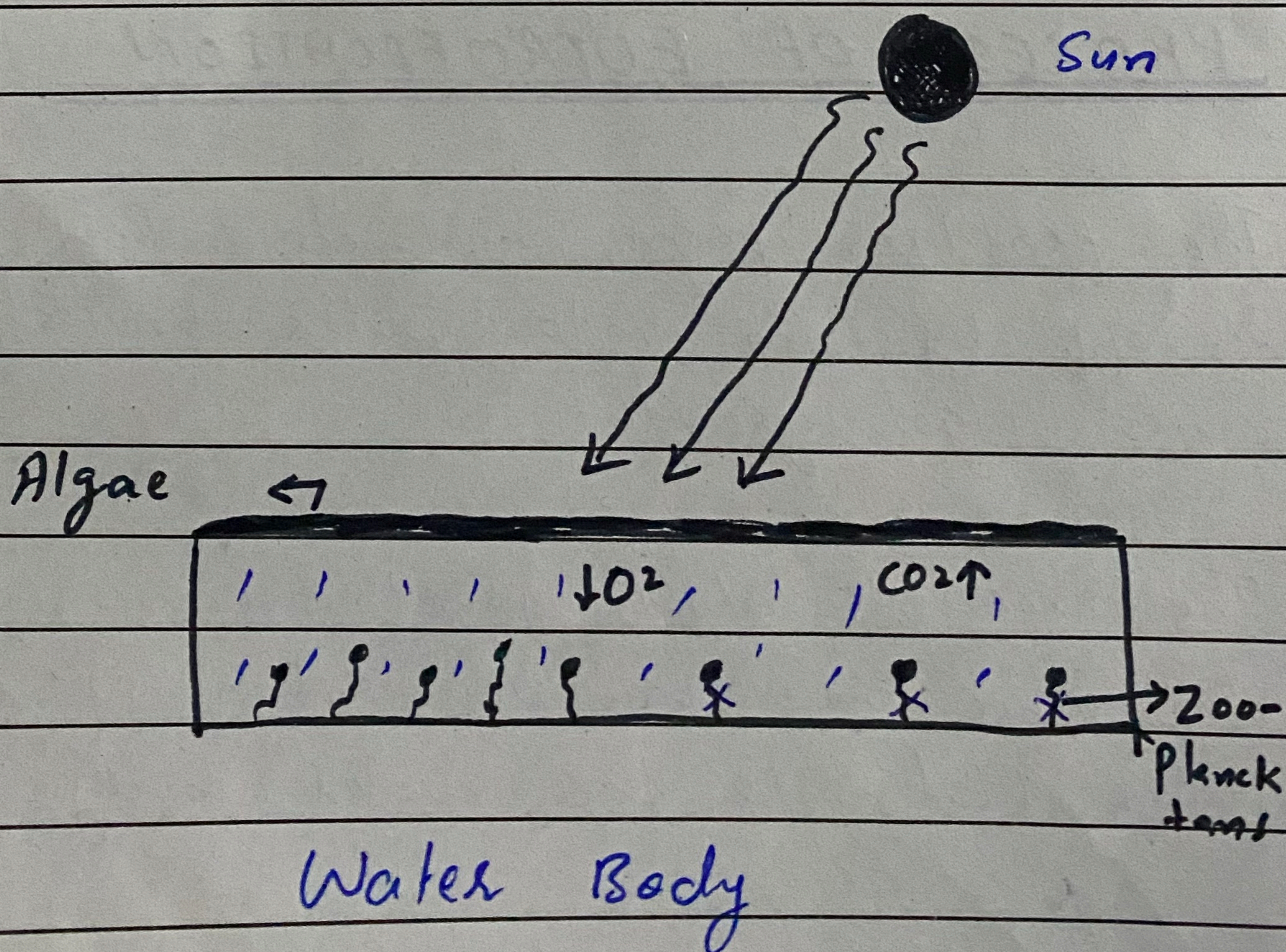
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iii) Due to the lack of solar heat, smaller plants begin to die

iv) This leads to decomposition of these dead plants

v) The decomposition decreases levels of oxygen and increases those of carbon dioxide in water body.

vi) The fisheries, zooplanktons, and other organisms start to die due to decrease levels of oxygen.



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5) IMPACTS OF EUTROFICATION

- i) It adulterates the water quality.
- ii) It reduces the oxygen levels of the water bodies
- iii) It causes biodiversity loss.
- iv) It causes health risks to animals as well as humans
- v) It worsen the aesthetic value of water bodies.

6) CONTROLLING MEASURES FOR EUTROFICATION

6.1) Sustainable Agriculture
Eutrophication can be controlled by reducing the use of fertilizers.
Moreover, separate mitigation systems to evacuate the water of croplands should be adopted

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6.2) Waste Water Treatment

Eutrophication can be reduced by the treatment of waste water, coming from domestic and industrial sources. This can be done by process such as filtration, and Biological nutrient removal BNR

6.3) ECOLOGICAL RESTORATION

Ecological restoration can reduce the algal growth by introducing such organisms which can eat algae. For instance, ~~the~~ introducing Tilapia into water body, which eat algae.

6.4) ENVIRONMENTAL AWARENESS

Educating people about the causes and consequences of eutrophication, as well as telling them about the importance of controlling it is necessary, to control eutrophication.

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6.5) IMPLEMENTING SUSTAINABLE DEVELOPMENT GOALS & SDGs

Implementing sustainable development goals by meeting the needs of today and not compromising the future of a next generation can also reduce eutrophication.

6.6) NATIONAL EFFORTS ARE REQUIRED

Eutrophication can be controlled by introducing policies and laws to control it. Moreover, it must be controlled through effective implementation system which involves government, public and related stakeholders like industrialists, farmers.