

Haileybury MUN

Research report



Environmental Commission

The question of Agriculture and the Hydrosphere

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Definitions:

Agriculture

The science, art or practice of cultivating the soil, producing crops, and raising livestock and in varying degrees the preparation and marketing of the resulting products; farming

Hydrosphere

The aqueous envelope of the earth including bodies of water and aqueous vapor in the atmosphere; the water cycle

Introduction:

Agriculture has a range of impacts on the hydrosphere, as a consequence of various processes or chemicals used. Processes such as deforestation or traditional rural slash and burn farming can cause soil erosion which could lead to flooding. The use of fertilisers or pesticides can lead to pollution of water systems and eutrophication. Additionally, the use of water in irrigation can have negative impacts on water availability for an area.

Key Issues:

Deforestation

The cutting down of trees for the purpose of agriculture can have an impact on the hydrosphere and can lead to increased flooding of areas, specifically flash floods. Flash floods have an impact on human society, but also on the environment. They can cause increased discharge and sedimentation of water bodies and drown organisms. An example of the impacts of this are the Haiti floods of 2004 that killed over 800 people, destroying many habitats as well. Moreover, deforestation can be linked to decreased rain in areas as a consequence of lower levels of plant transpiration. This can lead to the drying up of various bodies of water.

Irrigation

In many areas, particularly in LEDCs, there are problems with water availability. With the inefficient irrigation and poor quality and knowledge creating sustainable irrigation systems, water wastage can become a serious problem. Pumping water from underground to the surface for irrigation can also increase the drought vulnerability of various areas. Because of rising populations, we are faced with the challenge of finding sustainable methods of irrigation.

Legislation

There are also problems with legislation in various nations, in which there is no monitoring system for the removal of water from water bodies for use in agriculture. An example of this is the Murray Darling River Basin in Australia, where only recently legislation was put in place upon a government investigation following drought and the depletion of water in the river basin.

Fertilisers and pesticides

Agriculture often involves the use of pesticides and fertilisers and this is often leached from farmland into the hydrosphere. This leaching of chemicals into water bodies can have various effects, from a change in pH to eutrophication. Change in pH can result in the death of many organisms, as a consequence of a denaturalisation of enzymes. Moreover, the leaching of fertilisers can cause the leaching of nutrients into water bodies, which can cause algal blooms, which could result in the death of organisms in the body, as a consequence of eutrophication.

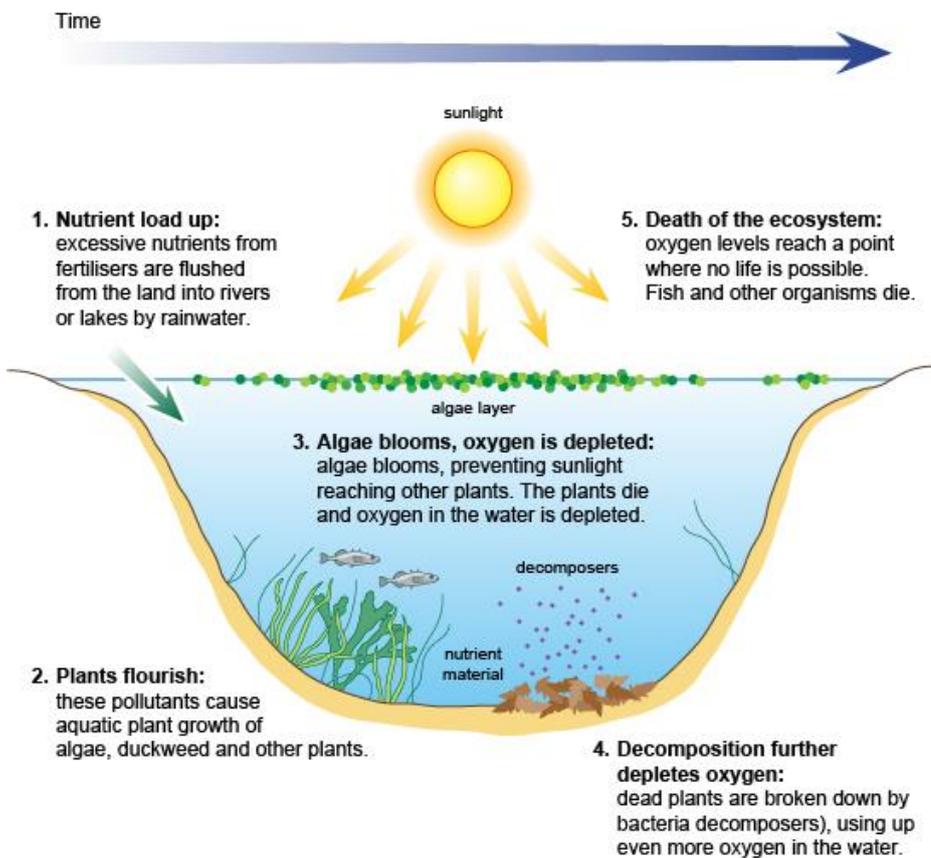


Diagram of eutrophication from <https://razosbiologyresources.weebly.com/eutrophication.html>

Useful Links:

- <http://www.3plearning.com/blog/deforestation-impacts-earths-water-cycle/>
- <https://phys.org/news/2015-11-irrigation-drought-vulnerability-regions.html>
- <https://www.sciencelearn.org.nz/resources/726-humans-and-the-water-cycle>

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