

(CSS 2020)

What are technological approaches to environmental management? (10)

Environmental technology

Environmental technology is an emerging field that is science based and interfaces the study of environmental policy and law, renewables, sustainability and environmental management systems.

It, in general, includes following technological treatments.

i. Pollution Control technologies

Air scrubbers, catalytic converters, and wastewater treatment plants help reduce pollution in the atmosphere and water bodies.

ii. Bioremediation

Using microbes or plants to breakdown pollutants like oil, pesticides and heavy metals in soil and water.

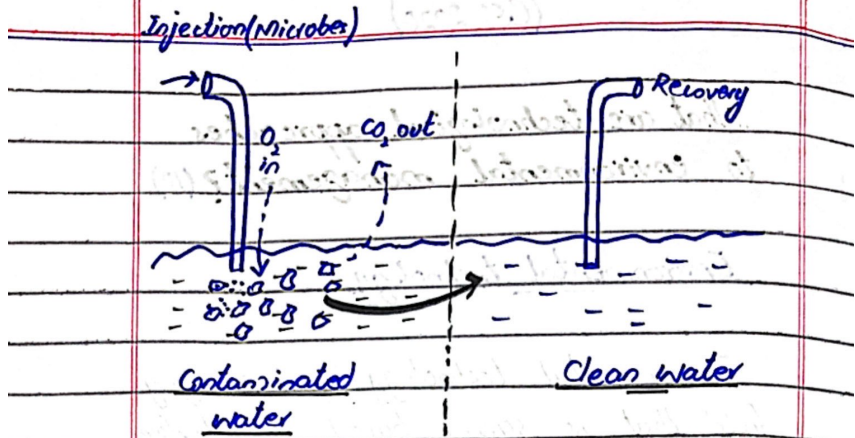


Fig: Bioremediation

iii. Solid Waste Management

Solid waste management is the purification, consumption, reuse, disposal and treatment of solid waste that is undertaken by government or the ruling bodies of city/town.

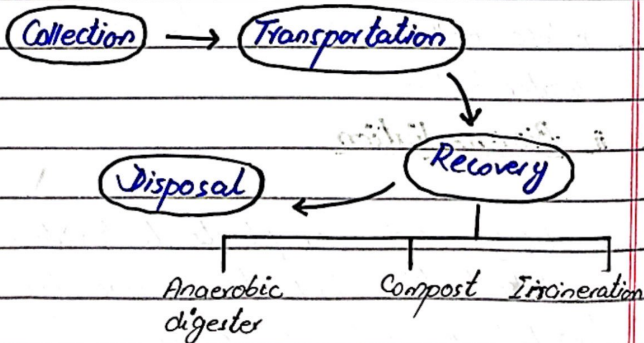


Fig: Solid Waste Management

iv. Renewable Energy

Technologies such as solar panels, wind turbines, and bioenergy systems reduce dependence on fossil fuels and lower greenhouse gases emissions

v. Sustainable Agriculture

Precision farming and agroforestry increase food production efficiency while decreasing environmental impacts

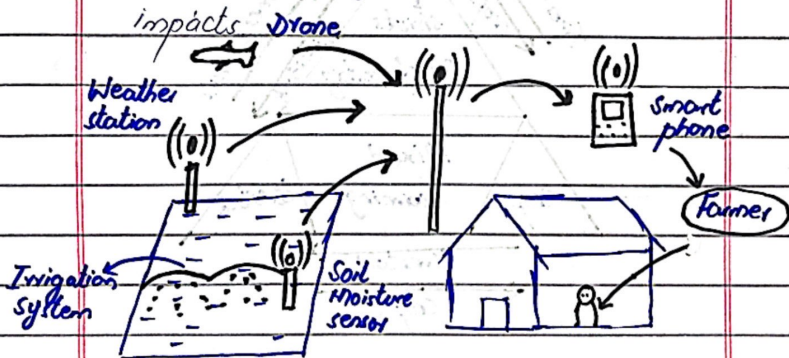


Fig. Precision Farming

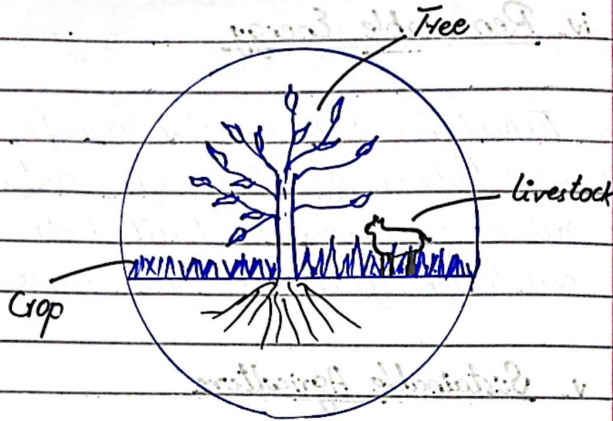
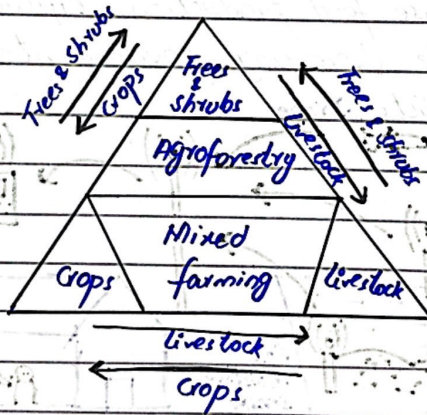


Fig. Agroforestry



vi. Solar radiations Management

Solar radiation management seek to reduce the sunlight absorbed.

This would be achieved by deflecting

sunlight away from earth, or by increasing reflectivity of atmosphere of Earth surface. SRM methods may include:

(a) Surface based :

Using roofing materials which increase reflectivity of buildings.

(b) Tropospheric based

Cloud brightening would spray fine sea water to white clouds to increase cloud reflectivity.

(c) Space based

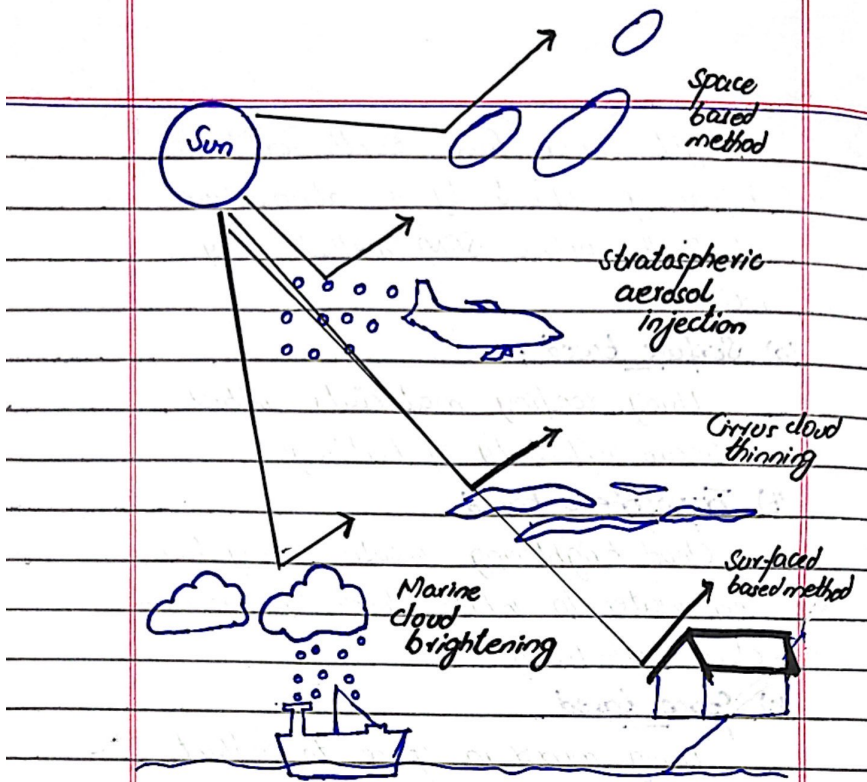
Using mirror in space to reflect rays without reaching earth.

(d) Stratospheric Aerosol injection

Spraying of materials into stratosphere like fine, light coloured particles designed to reflect back part of solar radiation cloud bring down temperature by 1°C.

(e) Cloud thinning

Cirrus clouds sprayed with Bismuth Tri Iodide become more more transparent, allowing reflected radiation to escape.



(vii) CO₂ removal

Following methods are important in reducing CO₂ in atmosphere.

(a) Ocean/ Iron fertilization

Iron fertilization is intentional introduction of Iron to upper layer of ocean to stimulate phytoplankton bloom, and draw down atmospheric CO₂ levels.

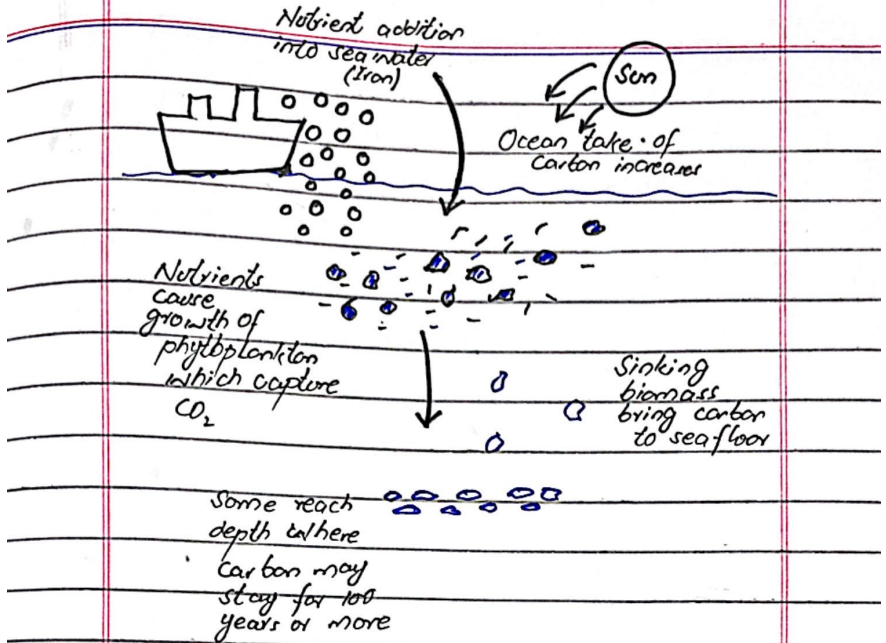


Fig : Ocean fertilization

(b) Carbon Capture and Storage

Carbon capturing and storage involves capturing of CO₂ at emission sources and transporting and then storing or burying it in a suitable deep, underground location.

