

How the man-made wetlands act as a viable alternative to treat waste water coming from a point source of pollution? Explain.

Man-made wetlands are alternative to sewage treatment plants as it requires less energy and economy for treatment of waste water. Thus waste land can be reclaimed as wetlands which can be used sustainably.

Alternative - for sedimentation:

1. Man made wetlands near construction sites can make sedimentation process for heavy debris and construction materials before discharging into water bodies.
2. Thus as an alternative, the heavy pollution load can decrease pollution of water bodies.
3. (e.g) Kolkata Municipal Corporation - constructed 25 drains near construction sites for sedimentation.

Alternative for aeration:

1. Heavy metals from agricultural point sources due to fertilizers.
2. Thus by creating free-falling, creates turbulence and aeration to remove dissolved gases like  $SO_2$ ,  $NO_x$  etc.

3. (e.g) Delhi Corporation created brunds and benches to increase aeration in wetlands.

### Alternative for heavy metals removal:

1. Industrial point sources like dyeing industries has heavy metals like arsenic discharge.
2. Thus Man-made wetlands having typha plants, Cyperus plants can absorb heavy metals and thus contribute to treating waste water.

### Concerns and Challenges:

1. Viable area:
  1. Man-made wetlands to be constructed in cities lack proper area.
  2. Thus construction for treatment being a reality problem for man-made wetlands.
2. Lack of implementation:
  1. Smart City programme involves natural treatment of waste water in urban areas.
  2. But lack of government-people nexus and low finance creates lack of implementation.

Man-made wetlands if properly implemented can contribute to sustainable development goal of Clean city and sanitation and thus the life on earth can be made viable for future generations.