

Q51

Explain the various methods of tidal power generation. Also explain the limitations of each method.

A1

There are four methods of tidal power generation.

* Tidal stream generator

Tidal stream generators make use of the kinetic energy of moving water to power turbines, in a similar way to wind turbines that use the wind to power turbines. Some tidal generators can be built into the structures of existing bridges or are entirely submerged.

Advantages

- Tidal stream generation is very cheap to implement.
- Tidal stream generators have the ability to incorporate them into existing structures like bridges & docks.

disadvantages

- Tidal stream generators generally cannot produce as much as barrage systems
- They are like barrage systems, prone to corrosion from saltwater

* Tidal barrage

A tidal barrage is a dam-like structure used to capture the energy from massive amounts of water moving in & out of a bay or river due to tidal forces

Limitation of tidal barrages

- They change the movement of water into and out of estuaries, which can disrupt the life cycles of certain marine life. They can prevent the movement of fish and other wildlife into and out of estuaries, which can disrupt spawning.

* Dynamic tidal power

Dynamic tidal power is a theoretical technology that would exploit an interaction b/w potential & kinetic energy in tidal flows. It proposes that very long dams be built from coast straight out into the sea or ocean, without enclosing an area.

* its Limitations.

- They are very costly
- They are untested the therefore their usefulness and environmental impacts are unknown.
- They can disrupt migration of marine life
- They can change coastal structures in unpredictable ways.

* Tidal Lagoon

A new tidal energy design option is to construct circular retaining walls embedded with turbines that can capture the potential energy of tides. The created reservoirs are similar to those of tidal barrages, except that the location is artificial and do not contain a pre-existing ecosystem.

* Its Limitations—

The two major disadvantages is that to the tidal lagoon and they are cost & maintenance. Building such a facility requires careful construction and a generally longer dem.