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**16/eng03/019**

**Cve505 Assignment**

**Question 1:**

Briefly describe how a productive borehole can be sited and developed in fractured basement complex regions

**Answer**

**Question 2:**

What are the disadvantages of large dam projects?

**Answer**

The environmental consequences of huge dams vary from time to time and from place to place and include direct impacts to the biological, chemical and physical properties of rivers and bank (or streamside) environments. Dams, particularly the giant ones, may cause a lot of problems for the surrounding areas, especially the zone behind the dam where the water flows toward the blockage. Some disadvantages are:

1. **Submergence problem**: A large area gets submerged due to the rise in the water levels and turned into a reservoir. The owners of those lands have to be relocated, adequately compensated, and well settled somewhere else. This requires an extra budget for planning a dam construction.
2. **Failure of dams**: Dam failures may be caused either due to many reasons. Neglecting possible forces or unexpected forces is the main reason for the failure. The faulty design or occurrence of unanticipated floods can also be the cause of failure. Not maintaining proper guidelines during design and construction is also a reason for dam failures. Dams may sometimes fail due to excessive and unanticipated earthquakes. The failure of dams can bring enormous hazards to the life of people in that locality.
3. **Water wastage**: Sometimes water used in excess of evapotranspiration requirements. This water appears in the system as surface or ground water. But it degrades in quality, mainly due to fertilizers or pesticides, besides minerals drawn from soils. Such waste has to be minimized.
4. **Impact on biosphere**: In aggregate, dammed rivers have also impacted processes in the broader biosphere. Most reservoirs, particularly those within tropical zones, contribute tons to gas emissions. Recent studies on the Congo have shown that the sediment and nutrient carried by the congo drive biological processes badly into the Atlantic, that includes serving as a carbon sink for atmospheric greenhouse gases.
5. Life cycles of habitats living in the water get affected due to the construction of dams. Their life cycles are adapted to natural river habitat and flow regimes. By altering the flow, the physical surroundings are altered.
6. Cycles and variation of flown downstream are established.
7. Standing water (reservoir) habitats replace flowing water habitats
8. Nutrients are unable to procedure downstream.
9. Coastal erosion is enhanced because of the loss of debris transportation. The large reservoir at china’s 3 gorges dam has worn near the boundary, which has led to landslides along the side of the reservoir. The nile delta has older erosion thanks to the reduction of sediment with the development of urban centers. Much of the sediment has fallen into the reservoir, which implies there’s less land around to farm and work on.
10. Productivity and species diversity of waterways are often reduced because of reduction of fresh flow.
11. A reduction in diversity happens

**Question 3:**

What are the effects of water pollution on the environment?

**Answer**

**Effects of water pollution on human health**

Water pollution kills. It caused 1.8million deaths in 2015, according to a study published in The Lancet. Water-borne pathogens in the form of disease causing bacteria and viruses from human and animal waste, are a major cause of illness from contaminated drinking water. Diseases spread by unsafe water include cholera, giardia, and typhoid. Even in wealthy nations, accidental or illegal releases from sewage treatment facilities, as well as runoff from farms and urban areas, contribute harmful pathogens to waterways. Thousands of people across the United States are sickened every year by Legionnaires’ disease.

**Effects of water pollution on the environment**

In order to thrive, healthy ecosystems rely on a complex web of animals, plants, bacteria, and fungi – all of which interact directly or indirectly with each other. Harm to any of these organisms can create a chain effect, imperiling entire aquatic environments.

When water pollution causes an algal bloom in a lake or marine environment, the proliferation of newly introduced nutrients stimulates plant and algae growth, which in turn reduces oxygen levels in the water. The dearth of oxygen, known as eutrophication, suffocates plants and animals and can create ‘dead zones’, where waters are essentially devoid of life. In certain cases, these harmful algal blooms can also produce neurotoxins that affect wildlife, from whales to sea turtles.

Chemicals and heavy metals from industrial and municipal wastewater contaminate waterways as well. These contaminants are toxic to aquatic life and make their way up the food chain as predator eats prey. That’s how tuna and other big fish accumulate high quantities of toxins, such as mercury. Marine ecosystems are also threatened by marine debris, which can strangle, suffocate and starve animals. Much of this solid debris, such as plastic bags and soda cans, gets swept into sewers and storm drains and eventually out to sea, turning our oceans into trash soup and sometimes consolidating to form floating garbage patches.

Meanwhile, ocean acidification is making it tougher for shellfish and coral to survive. Though they absorb about a quarter of the carbon pollution created each year by burning fossil fuels, oceans are becoming more acidic. This process makes it harder for shellfish and other species to build shells and may impact the nervous system of sharks, clownfish and other marine life.

**Question 4:**

What is a suitable approach to decontaminate river water, such as the Ureje River in Ado-Ekiti, which gets polluted daily by domestic and agricultural effluent?

**Answer**

One definite method to decontaminate the river water is to decrease the extent of pollution added to it. The common grey water effluent from domestic and commercial establishments should be treated the same way and the treated water should be reused for useful purposes. If this happens there would be no need for disposal into the river at all and there would therefore be no contamination.

other suitable methods to decontaminate waters such as the Ureje River, which has gotten polluted by domestic and agricultural effluent are;

1. Industrial treatment: before the water can be suitable for usage or disposal, it needs to be treated very correctly in the water treatment plants. A technically advanced water treatment plant fit industrial treatment can be helpful to use water for numerous purposes. Such plants reduce the amount of toxicity of waste and various harmful chemicals in water. Once treated the water becomes ready for various types of uses.
2. Septic tanks: they are tanks which consist of one or more concrete or plastic tanks of between 4000 to 7500 liters. They are usually employed to treat the sewage waste at various places or locations instead of treating that in any plant or sewage system. This particular method is used at individual building levels thus anybody can take such initiatives for environmental safe guard on their personal capacity.
3. Denitrification: this process is mainly used to eliminate nitrogen elements from sewage and municipal waste water. Apart from preventing the leaching of nitrates in soil, it equally stops the groundwater from getting easily contaminated.
4. Ozone waste water treatment: it is considered one of the most popular methods for purifying contaminated water now. In this method, pollutants and chemicals are broken down by an ozone generator. In addition to that, ozone oxidizes pollutants such as bacteria, molds and organic material from the contaminated water.