WATER RESOURCES ENGINEERING ASSIGNMENT

COURSE CODE: CVE 505

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SUBMITTED TO

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Question

a) **Briefly describe how a productive borehole can be sited and developed in a fractured basement complex region?**

Fractured basement complex are good sources for potable water in many part of the world. However, sitting of highly productive wells in these rock units remains a challenging and expensive task because fracture development at regional scale is both **heterogeneous** and **anisotropic (**Manda et al., 2006). In Ado Ekiti or Ekiti State generally, groundwater is found in fractured basement complex as the State is underlain by Precambrian basement rocks. It is also stated that aquifer found in fractured basement in Ado Ekiti and its environs has relatively very low yield, (Gabriel et al, 2014).

The process of siting a borehole in a fractured basement complex region; The very first thing that needs to be determined is where the water is, and how we're going to get to it. Once the hydro-geologists have helped us prep a path for borehole drilling, we follow through and construct the borehole. In order to most accurately gauge the yield of a domestic water borehole an aquifer test is performed. This involves Water Demand (WD) Determination, Reappraisal of Geophysical Survey, Pumping Tests, Recovery Test, Constant Rate Test and Analysis. Then the kind of pumping system and piping installed in your new domestic water borehole will largely depend on the intended use of the borehole water.

b) **What are the disadvantages of a large dam projects?**

Dams are one of the foremost spectacular and well- notices aspects of contemporary infrastructure. Throughout history, dams have played a vital role

in the growth and enlargement of civilization. Many ancient town planners relied on dams to funnel water through their cities even though it was far-off, whereas military leaders used dams to change parcel that they planned to fight on. however, their existence is contentious. Dames are created to store water and for the management of the water moving down the stream or watercourse. Dams just like kanji dam in Nigeria, hoover dam, or the three gorges dam in china, are known for the reduction of electricity, or to facilitate water for irrigation and flood prevention. Dams, particularly the large ones, cause a lot of problems to the surrounding areas such as:

i. Negative impact on aquatic animals.
ii. Impact on the waterbody.
iii. Effect on the overall aquatic ecosystem.
iv. Impact on groundwater table.
v. Impact on biosphere.
vi. Erosion of encompassing soil.

Although modern planning and design of dam have been less prone to devastating result, in the past old dams have been known to rupture over time. This led to deaths and flooding in several places.

c) What are the effects of water pollution on the environment?

The environment, health conditions and the world economy are affected by declining water quality. World Bank President David Malpass warns of the economic impact: "Deteriorating water quality is stalling economic growth and exacerbating poverty in many countries". The reason is that the growth in the Gross Domestic Product (GDP) of the regions within the related water basins declines by a third as biological oxygen demand, the metric that calculates the

organic pollutants present in water, crosses a certain level. Furthermore, below are some of the other effect:

i. Destruction of biodiversity.
ii. Contamination of the food chain
iii. Lack of potable water
iv. Disease. The WHO estimates that about 2 billion people have no option but to drink water contaminated by excrement, exposing them to diseases such as cholera, hepatitis A and dysentery.
v. Infant mortality.

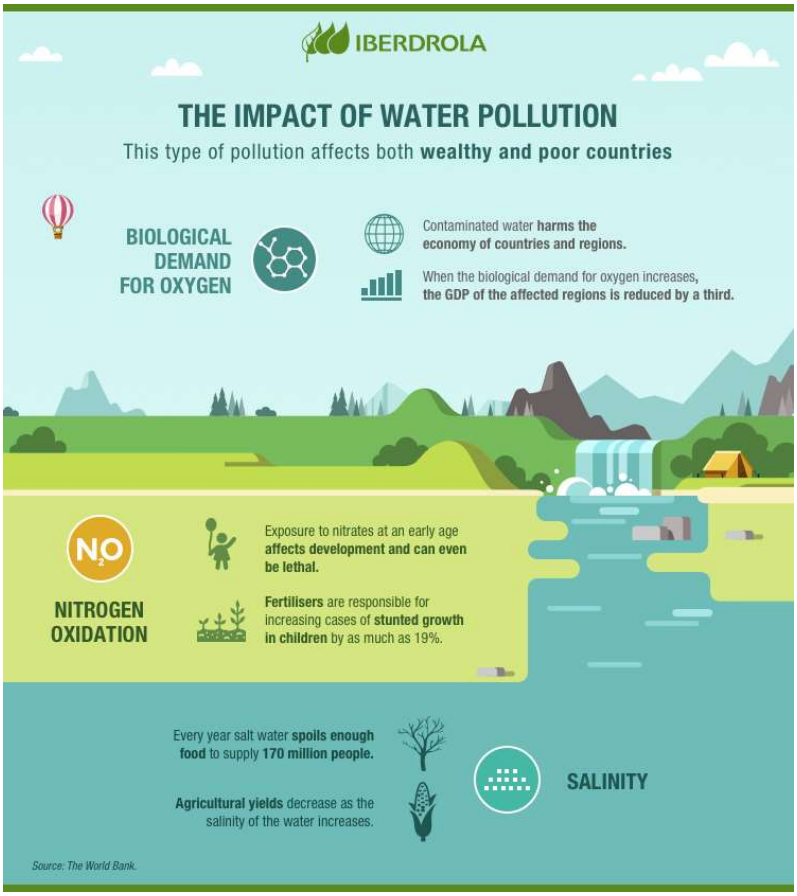

Figure: effect of water pollution.

Source: Iberdrola.com

d.) What is a suitable approach to decontaminating river water such as ureje river in Ado ekiti, which gets polluted daily by domestic and agricultural effluent?

1) Dredging of the contaminated sludge from the river bad
2) Handling it to the river banks for treatment.
3) Establishing sludge cleaning processes
4) Converting it to useful soil
5) If required extracting precious material out of the sludge
6) Treating the contaminating sources to the river and return clean water to the river.