

Name: Sadiku Faith Oyindamola

Matric No: 16/mhs03/030

Course Code: CVE 505

1. Briefly describe how a productive borehole can be sited and developed?

Siting boreholes and wells successfully requires a good understanding of where groundwater occurs and how it behaves in the local environment. Developing this understanding starts with reconnaissance, and is refined by hydrogeological fieldwork and geophysical surveying.

Reconnaissance

Reconnaissance is an essential first step in understanding groundwater resources and siting new water boreholes. It is a desk study: gathering any available relevant maps and information (e.g. from existing reports, academic papers etc.) on geological and hydrogeological conditions.

Hydrogeological Fieldwork

This involves making field observations of the local geology, hydrogeology and existing water sources, and gathering information from sources such as discussions with the local community. Local dry and wet season water sources should be visited, and discussions held with the community to find out more details: e.g. how much they yield; do yields fall or dry up in the dry season; are there water quality problems? Rock exposures (e.g. in river cuttings or cliffs) can give more information on local geology, as can chippings/cuttings from any local hand-dug wells or previously drilled boreholes (failed or working). It is also important to observe any local sources of pollution, such as pit latrines, burial grounds, cattle pens or market areas.

Geophysical Surveying

Geophysical surveying to support water borehole siting is often needed because the information collected during reconnaissance isn't enough to allow a confident assessment

of where groundwater can be found. Geophysical surveying is a huge topic and only a very brief introduction is given here.

There are many different geophysical techniques and countless types of equipment. Two of the main geophysical techniques used in borehole siting are electrical resistivity; and ground conductivity using FEM (frequency domain electromagnetic).

It is important that geophysical techniques are carried out and interpreted carefully by well-trained personnel. If surveying is done wrongly or survey results interpreted wrongly, at best the information given will be of no help, and at worse it can lead to expensive mistakes in borehole siting.

2. What are disadvantage of large dam projects?

Some of the disadvantages are:

- Building a dam is very expensive, the government needs to ensure that strict guidelines are followed and a very high standard is maintained.
- They must operate for many years in order to become profitable enough to compensate for the high building cost.
- People residing in villages and towns in the nearby area, where there are chances of flooding, have to be relocated. They lose their businesses and farms.
- Sometimes people are removed forcibly to set up hydro-power plant and it poses a serious ethical concern.
- The building of large dams can cause serious changes to the earth's surface and lead to geological damage. It can trigger frequent earthquakes; however, modern planning and design of dams have reduced the possibility of occurrence of certain disasters.

3. What are the effects of water pollution on the environment?

Water Pollution is damaging the environment, health conditions and the global economy. The president of the World Bank, David Malpass, warns of the economic impact: "Deteriorating water quality is stalling economic growth and exacerbating poverty in many countries". The

explanation is that, when biological oxygen demand — the indicator that measures the organic pollution found in water — exceeds a certain threshold, the growth in the Gross Domestic Product (GDP) of the regions within the associated water basins falls by a third. In addition, here are some of the other consequences:

- Destruction of biodiversity. Water pollution depletes aquatic ecosystems and triggers unbridled proliferation of phytoplankton in lakes — eutrophication —.
- Contamination of the food chain. Fishing in polluted waters and the use of waste water for livestock farming and agriculture can introduce toxins into foods which are harmful to our health when eaten.
- Lack of potable water. The UN says that billions of people around the world have no access to clean water to drink or sanitation, particularly in rural areas.
- 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.
- Infant mortality. According to the UN, diarrhoeal diseases linked to lack of hygiene cause the death of about 1,000 children a day worldwide.

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?

Waste water from domestic sources is hardly treated, due to inadequate sanitation facilities. This waste water, containing highly organic pollutant load, finds its way into surface and groundwater courses near the vicinity of human habitation from where further water is drawn for use. Considerable investments should be done to install the treatment systems.

For the agricultural sector, water and electricity for irrigation are subsidized for political reasons. This leads to wasteful flood irrigation rather than adoption of more optimal practices such as sprinkler and drip irrigation. Optimized irrigation, cropping patterns and farming practices should be encouraged for judicious use of water.

