R V Institute of Technology and Management
Name: Shubham Luharuka
USN :- 1RF19CS050

1. Analyse the causes, effects and control measures of Radon contamination in groundwater.

Ans:
Cause of Radon in Groundwater.
Radon is a gas that has no colour, odour, or taste and comes from the natural radioactive breakdown of uranium in the ground. You can be exposed to radon by two main sources.

a) Radon in the air in your home (frequently called "radon in indoor air") and most of the radon in indoor air comes from the soil underneath the home. As uranium breaks down, radon gas forms and seeps into the house. Radon from soil can get into any type of building - homes, offices, and schools - and build up to high levels in the air inside the building.
b) Radon gas can also dissolve and accumulate in water from underground sources (called groundwater), such as wells. When water that contains radon is used in the home for showering, washing dishes, and cooking, radon gas escapes from the water and goes into the air. It is similar to carbonated soda drinks where carbon dioxide is dissolved in the soda and is released when you open the bottle. Some radon also stays in the water.

Radon is not a concern in water that comes from lakes, rivers, and reservoirs (called surface water), because the radon is released into the air before it ever arrives at your tap. The main problem is with the ground data.

Effects of Radon contamination of groundwater.

- Breathing radon in indoor air can cause lung cancer.
- Radon gas decays into radioactive particles that can get trapped in your lungs when you breathe it.
- As they break down further, these particles release small bursts of energy. This can damage lung tissue and increase your chances of developing lung cancer over the course of your lifetime.
- People who smoke have an even greater risk

- Only about 1-2 per cent of radon in the air comes from drinking water
- Drinking water containing radon also presents a risk of developing internal organ cancers, primarily stomach cancer. However, this risk is smaller than the risk of developing lung cancer from radon released to air from tap water.

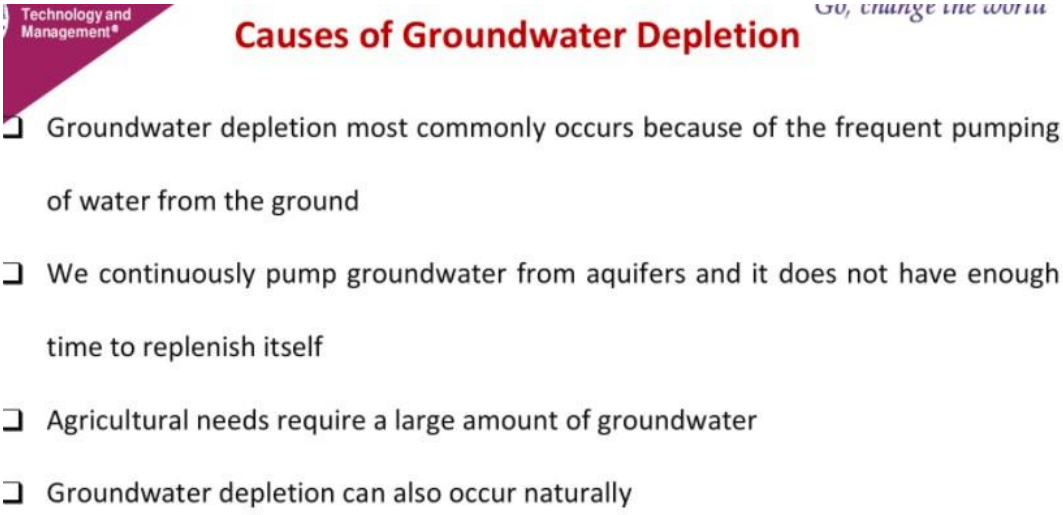
Control Measures to be taken:

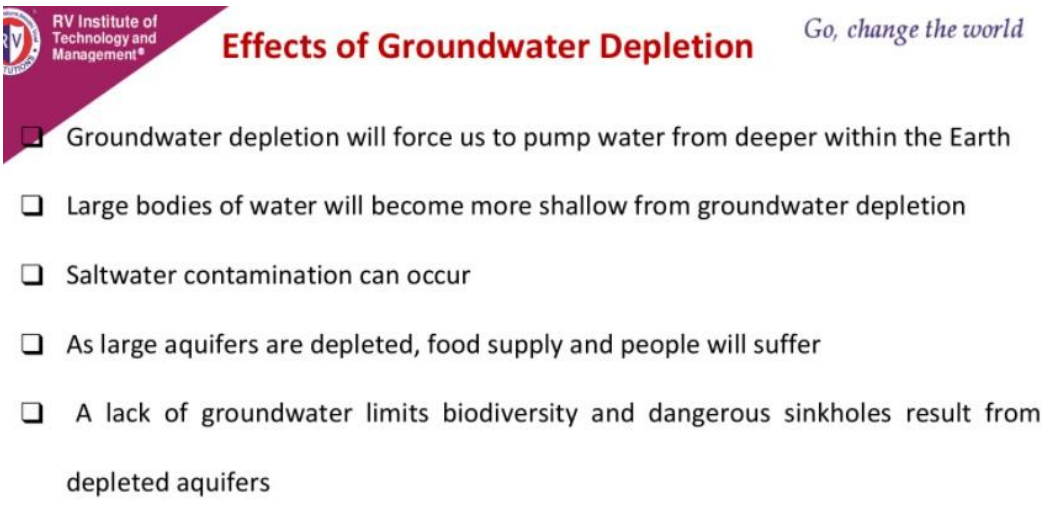
- Water supply systems have to be tested to identify current radon levels. Aeration treatment is considered to be the most effective technology for removing radon from drinking water supplies.

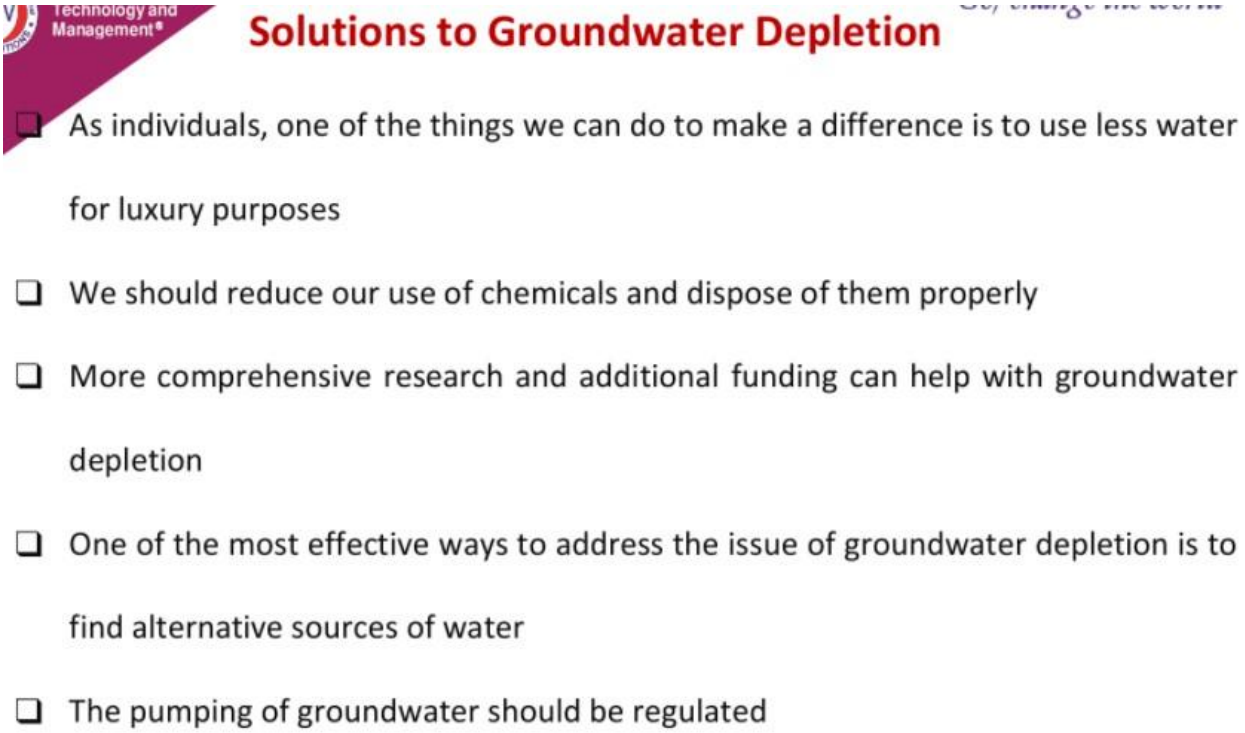
- Use proper water content in concrete mix to minimize slab shrinkage and cracks.
- Install flexible expansion joint material at all floor wall joints and any control joints between separately-poured slab sections.

2. **Analyse the causes, effects and control measures of ground water depletion.**

Ans:







3. **Functioning of GIS in natural disaster management**

Ans

GIS play an important role during Disaster Mangemnt. The first and the foremost task of Disaster management is to identify the disaster prone areas of a country.

With the help of GIS, Managers can Identify the areas which are likely to be affected by any disaster, this can be based on the previous data .

Following are the primary responsibilities of disaster management :

- Know about the disaster prone area.
- Planning safety measures.
- Planning rescue and evacuation.
- Rehabilitation And post disaster management

It also helps in planning of safety measures like

- Creation of the maps for different disasters : As we know we can create the personalized maps, so you can use any GIS tool to create different maps for the different regions according to the nature of the disaster.
- Planning the pre disaster things : Pre disaster thing like identifying number of construction site and the safety measures are identified on the basis of the past data by locating on the maps, and by researching the areas where adversity is highly likely to happen.
- Identifying the medicals and hospitals for treatment nearby : One can identify the nearby hospitals for the treatment of the victims.

Disaster management plans the rescue and evacuation of the people, who get stuck in the calamity. GIS helps in planning the evacuation and rescue route, whether it should be by road, by water or by air whichever will be the safest.

GIS will help Identifying the safe location for rehabilitation that are locations as well as zones for the rehabilitation of the victims nearby the affected place. for getting the mapping of the whole affected area we will be using GIS in Disaster Management.

So, This is how Disaster Management is using GIS for performing their tasks more efficiently. Using GIS in Disaster Management is one of the best method to have some control over the calamities.

4. **Analyse the functioning of waste water treatment plant**
   Ans
   A wastewater treatment plant is working on 4 phsae:

a) Pretreatment Phase

Waste water plants remove the 'easy pickings' during the pretreatment phase. A set of bar screens rakes away large items such as tree limbs, garbage, leaves, cans, rags, plastic bottles, diapers and other waste materials. The basins hold sewage until it is ready for treatment and handle overflows due to heavy rains. Some plants skim grease and fats off the surface of the water during pretreatment, sometimes using air blowers to whip the oily material into a froth for easier removal. Other plants remove grease during primary treatment.

b) Primary Treatment-

After pretreatment, the waste water collects in primary clarifiers, which are large basins and sedimentation tanks. Gravity allows smaller particles to settle out. Mechanically driven scrapers collect solid matter and direct it to hoppers connected to the sludge treatment equipment. If the plant didn’t remove grease and oil during pretreatment, it does so in this phase using surface skimmers. Some plants use equipment to saponify collected fats by mixing them with lye, thereby producing soaps and glycerol.

c) Secondary Treatment

In the next phase, plants aerate and agitate the waste water in secondary basins, adding beneficial microorganisms to break down organic matter into sludge. Plants employ a number of alternative strategies to break down sludge. The resulting

biological floc removes carbon and nitrogen from organic wastes. Oxidation can occur on the surface—in lagoons—or in filter beds containing coked coal and limestone. Some facilities construct wetlands and reed beds that decompose organic materials. Other technologies used include membrane bioreactors and biological aerated filters. The resulting waste water collects and settles in a secondary clarifier tank.

d) Sludge Treatment

The final phase is to treat the remaining water and biosolids, or sludge. Gravity separates organic waste from heavier grit, which can be deposited in a landfill. The remaining primary sludge passes to a thickener, where it is centrifuged and fed to digesting tanks containing anaerobic bacteria. These tanks produce methane that can be used to power the plant. The final solid product, stabilized sludge, can be partially deodorized and plowed into soil as fertilizer. The remaining waste water is treated to remove phosphorus, nitrogen and other nutrients, disinfected with chlorine, ozone or ultraviolet light and then returned to the water supply. All discharge from and equipment used by waste water treatment plants must meet U.S. Environmental Protection Agency standards.