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Answer (1):

Hydrological cycle:

It describes the path of a water droplet from the time it falls to the ground until it evaporates and returns to our atmosphere. The difference in density between moist air and dry air allows moist air to rise through the troposphere until it reaches buoyant equilibrium.

The sum of all processes in which the water moves from the land and ocean surface to atmosphere and back in the form of precipitation.

The hydrological cycle of the world has been disturbed. The following reasons are causing disturbance of the hydrological cycle

1) Paved surface:

The surface of the earth is mostly paved due to which surface runoff is increased and absorption is decreased inside the water which is causing disturbance of the water cycle.

2) Global warming:

Global warming is the issue of current world. Everyone is effected from this issue but hydrological cycle is effected most. Due to global warming it is causing melting of the glaciers and ice which is causing heavy rainfall and it is making the lakes water contract . due to global warming the surface evaporation is increased. These reasons causing water cycle disturbance.

3) Dam Building:

Dam increases water storage and decreases river levels.
Increase evaporation which may increase local rainfall.

4) Deforestation:

it increase river flow due to increase in land flow

5) Irrigation:

Taking water from surface or ground water can reduce river flow. More crops means more water is removed from the Hydrological surface.

The world agriculture output is heavily dependent on irrigation. Out of a global cropped area 16% is irrigated. Global warming is likely to have a major impact on the hydrological cycle and consequently on irrigated agriculture. This impact may be more significant than the direct effect of higher temperature. Within many near East and African countries current water resources are almost fully exploited and supplies has to double over the next 20-30 years to maintain the current, even unsatisfactory status quo.

Unfortunately in most cases hydrology is treated on a national, rather than a regional, global scale. It is heavily dependent on accurate data collection. With national water resources agencies generally small units within major ministries and having low priority, funding has fallen to such an extent that in the majority of African countries reliable data are no longer collected (World Bank/UNDP/ADB/EC/French Government, 1993). The seriousness of the problem has yet to be addressed; although the World Bank is promoting a new 'Integrated Approach to Water Resource Management for Sub-Saharan Africa' and other regions of the world, whilst WMO is attempting to set-up a 'World Hydrological Cycle Observing System (WHYCOS)' (Rodda *et al.*, 1993) and FAO is establishing a programme to develop a worldwide water database with hydrological modeling capability using Geographic Information System (GIS) and remote sensing technology.

Answer (2):

Ground Water:

Ground water is the water found underground in the cracks and spaces in soil, sand and rock. It is stored in and moves slowly through geological formation of soil.

It is the water that seeps through the soil and collects above the non-porous rocks deep under the ground.

Ground water sustainability:

It is the development and use of groundwater resources to meet current and future beneficial uses without causing unacceptable environmental or socioeconomic consequences.

Rain Water Harvesting:

It is a type of harvest in which the rain drops are collected and stored for the future use, rather than allowing them to runoff. Rainwater can be collected from river roofs and redirected to deep pit.

It is a technique of collection and storage of rainwater into natural reservoirs or tanks, or the infiltration of surface water into subsurface aquifer before it is lost as sub surface runoff.

In both i.e. ground water sustainability and rain water harvesting as it is clear from the above statements that in both cases water is stored for future use through different method opted. Both of them are going to meet the current and future needs of the society.so through this they are linked.

Answer (3):

Water is a good solvent it never occurs in its pure form. It contains dissolved and suspended substances. The quality of water is determined by these parameters.

Generally water supplies can get contaminated or impure because they are exposed to impurities. So making ensure that this water is potable or not. So water should be tested in order for the determination of any impurity that may cause diseases, odor to water, bed color and bed taste to water. If water is not potable so making it potable the water is treated. In treatment process water is either passed through filtration or sedimentation process or some chemicals may be added to get the water portable. In the later case chlorine or other disinfecting chemicals is used.

The Quality parameters that should be considered in designing water supply system for a Community are:

1. Physical properties
 - a) Temperature
 - b) Color
 - c) Odor
 - d) Turbidity
 - e) Electrical conductivity

2. Chemical composition

- a) PH
- b) Salinity
- c) Alkalinity
- d) Major ions
- e) Hardness

3. Biological properties

- a) Dissolved oxygen
- b) Biochemical oxygen demand (BOD)
- c) Chemical oxygen demand (COD)