Types of Droughts

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What is Drought ?

- Drought, lack or insufficiency of rain for an extended period that causes a considerable hydrologic (water) imbalance and, consequently, water shortages, crop damage, streamflow reduction, and depletion of groundwater and soil moisture.
- It occurs when evaporation and transpiration (movement of water in the soil through plants into the air) exceed precipitation for a considerable period.
- Drought is the most serious physical hazard to agriculture in nearly every part of the world.
- Categorized four basic approaches to measuring drought: meteorological, hydrological, agricultural, and socioeconomic.

Four Types of Droughts

Meteorological drought

- Meteorological drought is defined usually on the basis of the degree of dryness (in comparison to some “normal” or average amount) and the duration of the dry period. Definitions of meteorological drought must be considered as region specific since the atmospheric conditions that result in deficiencies of precipitation are highly variable from region to region.
- For example, some definitions of meteorological drought identify periods of drought on the basis of the number of days with precipitation less than some specified threshold.

Agricultural drought

- Definition of agricultural drought should be able to

account for the variable susceptibility of crops during different stages of crop development, from emergence to maturity.

- Deficient topsoil moisture at planting may hinder germination, leading to low plant populations per hectare and a reduction of final yield.
- However, if topsoil moisture is sufficient for early growth requirements, deficiencies in subsoil moisture at this early stage may not affect final yield if subsoil moisture is replenished as the growing season progresses or if rainfall meets plant water needs.

Hydrological drought

- Hydrological drought is associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply (i.e., streamflow, reservoir and lake levels, groundwater).
- The frequency and severity of hydrological drought is often defined on a watershed or river basin scale.
- Although all droughts originate with a deficiency of precipitation, hydrologists are more concerned with how this deficiency plays out through the hydrologic system.
- Hydrological droughts are usually out of phase with or lag the occurrence of meteorological and agricultural droughts.
- It takes longer for precipitation deficiencies to show up in components of the hydrological system such as soil moisture, streamflow, and groundwater and reservoir levels. As a result, these impacts are out of phase with impacts in other economic sectors.

Socioeconomic drought

- Socioeconomic definitions of drought associate the supply and demand of some economic goods with elements of meteorological, hydrological, and agricultural drought.

- It differs from the aforementioned types of drought because its occurrence depends on the time and space processes of supply and demand to identify or classify droughts.
- The supply of many economic goods, such as water, forage, food grains, fish, and hydroelectric power, depends on weather. Because of the natural variability of climate, water supply is ample in some years but unable to meet human and environmental needs in other years.
- Socioeconomic drought occurs when the demand for an economic good exceeds supply as a result of a weather-related shortfall in water supply.