

## Drought and Its Potential Impacts on Agriculture

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### SUMMARY

“A deficiency of precipitation over an extended period of time (usually a season or more), resulting in a water shortage.” In easier to understand terms, a drought is a period of unusually persistent dry weather that persists long enough to cause serious problems such as crop damage and/or water supply shortages. The severity of the drought depends upon the degree of moisture deficiency, the duration, and the size of the affected area.

### INTRODUCTION

Droughts affect people in a several ways. Access to clean drinking water is essential for all life, and sources of water may dwindle during a drought. Without the presence of water, people must bring in enough water from elsewhere to survive. Water is also needed for crops to grow. When not enough precipitation falls to naturally water crops, they must be watered by irrigation. Irrigation is possible only when there is enough water in nearby rivers, lakes, or streams, or from groundwater. The lack of adequate precipitation, either rain or snow, can cause reduced soil moisture or groundwater, diminished stream flow, crop damage, and a general water shortage. Droughts are the second-most costly weather events after hurricanes. Unlike with sudden weather events such as hurricanes, tornadoes, and thunderstorms, it is often difficult to pinpoint when a drought has started or when it has ended. The initial effects of a drought may be difficult to identify right away, so it may take weeks or months to determine that a drought has started. The end of a drought is hard to identify for the same reason. A drought may last for weeks, months, or even years. Sometimes, drought conditions can exist for a decade or more in a region. The longer a drought lasts, the greater the harmful effects it has on people.

### Types of drought

Droughts can be classified as as metrological, agricultural, hydrological and physiological depend upon the deficiency of rainfall or the moisture stress in soil. Occurrence of drought is noticed many parts of country during kharif when the monsoon is delayed or it fails to occur. The success of crop depend upon the amount of rainfall received. The India meteorological Department has define drought on the basis of rainfall and area affected due to draw in rainy season.

#### 1. Metrological drought

It is a drought when the rainfall deficiency is more than 20% of normal rainfall over an area. The metrological drought is called moderate when the deficiency is between 26 and 50% of the normal rainfall. If the deficiency of rainfall is more than 50% it is known as a severe drought.

#### 2. Hydrological drought

When when metrological drought continues it results into hydrological drought with the depletion of surface water and drying of reservoirs, lakes, streams and rivers. It may be reflected in depleted snowmelt due to poor snowfall in an earlier season and this may result in curtailment of power generation and thus effect industry as well as agriculture.

#### 3. Agricultural drought

When the soil moisture and rainfall are not sufficient during the growing season to support healthy crop growth in maturity and causes extreme during the wilting.

It constitute great hazard to agriculture in both the temperate and tropical region. There are three different types of agricultural drought are as follows

##### A. Permanent drought

It is found in arid region where there is not enough precipitation to satisfy the water needs of crop. In this area agriculture is not possible without providing irrigation facilities through the year. The crop staken in this area are those with required less water during their growth period.

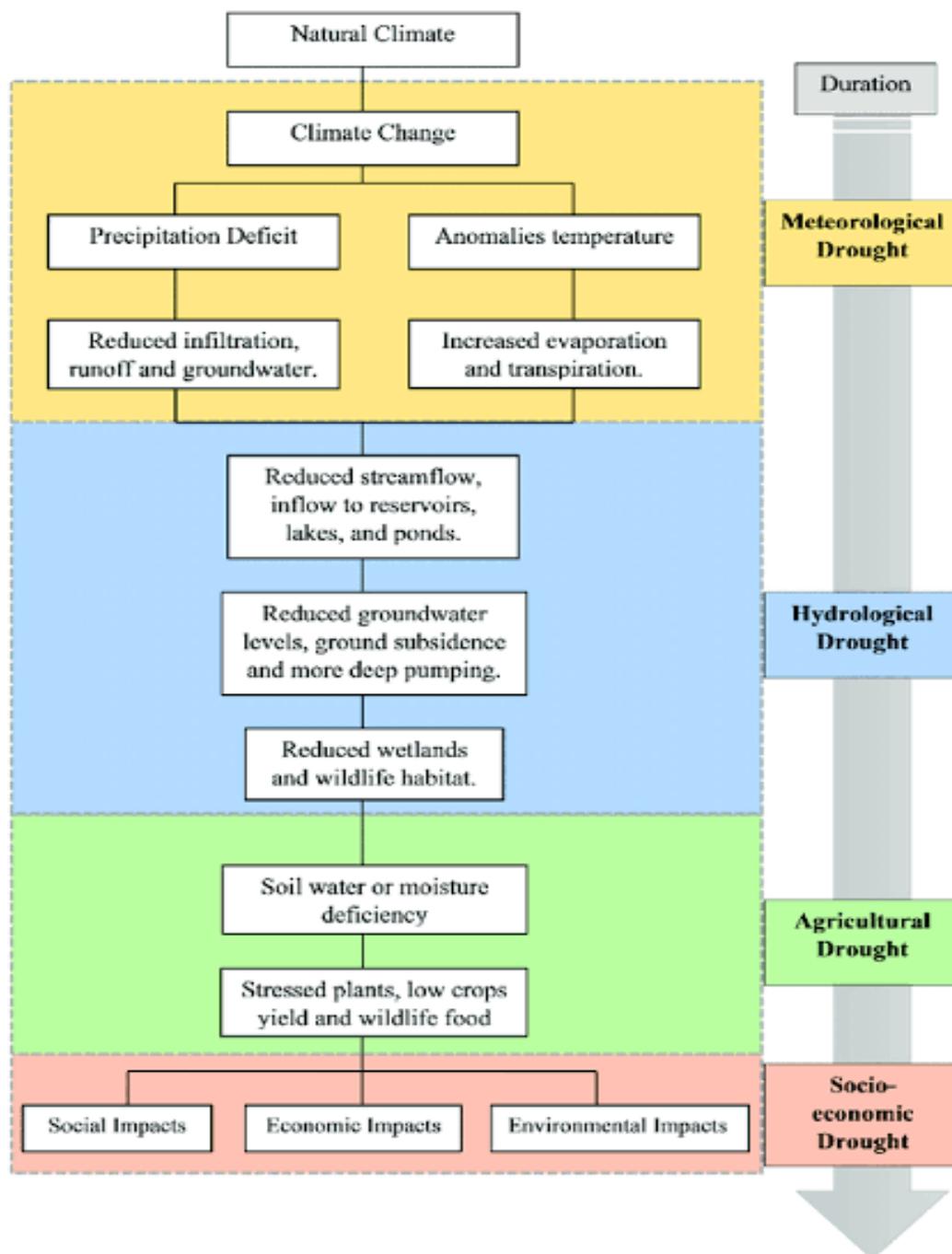
E.g. Western parts of Rajasthan and Gujarat

**B. Seasonal drought**

It occurs in areas with well define weight and dry season generally in tropic regions of the country. Agriculture is possible during rainy season or with the use of irrigation during the dry season. These areas receive hi rainfall during monsoon and prolonged dry spell.

**4. Socio- economic drought**

Socio economic drought associate the supply and demand of some economic good with elements of meteorological, hydrological, and agricultural drought. It differs from the above mentioned 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.



### **Impact of drought on Agriculture**

- Severe shortage of food-grains had been felt and the country had to resort to import of food-grains to save the poor people from hunger and starvation. However, India has been able to build a buffer stock of food-grains and threat from droughts is not as serious as it used to be before the Green Revolution.
- Indian agriculture still largely depends upon monsoon rainfall where about two-thirds of the arable land lack irrigation facilities and is termed as rainfed. The effect is manifested in the shortfalls of agricultural production in drought years. History is replete with examples of serious shortfall in cultivated areas and drop in agricultural productivity.
- Distress sale of cattle and loss of cattle life.
- Low intake of food and widespread malnutrition.
- Ill health and spread of diseases like diarrhoea, dysentery, cholera and ophthalmia caused by malnutrition, hunger and starvation.
- Decline in cultivated area and fall in agricultural production (including crops and milk).
- Fall in employment in agricultural sector.
- Fall in purchasing power.
- Scarcity of drinking water, food-grains and fodder.
- Migration of people from drought hit areas to other areas in search of livelihood and food.

### **Drought Escape**

- Escape from drought is attained through a shortened life cycle or growing season allowing plant to reproduce before the environment becomes dry.
- Flowering time is an important trait related to drought adaptation where a short life cycle can lead to drought escape.
- Matching growth duration of plant to moisture availability is critical to realise high seed yield.
- Drought escape occurs when phenological development is successfully matched with periods of soil moisture availability.
- Time of flowering is a major trait of crop adaptation to the environment particularly fail the growing season is restricted by terminal drought and high temperatures.
- Developing short duration varieties has been an effective strategy for minimizing yield loss from terminal drought as early maturity helps the crop to avoid the period of stress.

### **Drought Avoidance**

- To reduce water loss from plant due to stomatal control of transpiration
- Maintain water uptake through an extensive and prolific root system
- A deep and thick root system is helpful for extracting water from considerable depth.
- The root characters such as biomass length density and depth are the main drought avoidance traits that contribute to final yield under terminal drought in environments.
- Strategies to mitigate drought
- Water harvesting, protecting water sources against contamination, developing water sources – such as micro dams, ponds and wells, use of reserve sources of groundwater and water rationing/allocation
- Restoring pastures and balancing land and water resources
- Recovering the water holding capacity of soils through tree planting (including fruit trees) and the protection of riverbanks and wetlands
- Implementing Integrated Water Resources Management (IWRM), such as mitigating upstream-downstream user conflicts and coordinating between water users, communities and sectors
- Enhancing irrigation schemes.
- Diversifying rural livelihoods through social protection, cash-transfer programs or improving access to markets and rural services: Access to markets could help create alternative non-farm employment that could reduce the impacts of droughts
- Crop insurance
- Shifting to drought tolerant crops

- Managing livestock production within the landscape, including the relocation of herds, nomadic migrations and use of special reserved areas

### **CONCLUSION**

From the above information it is concluded that the information will be really helpful for the farmers of India in the Agriculture management. We have tried to provide the information is really helpful. As we know that there is great loss of foograins takes place due to the natural calamities, in that drought is one of them. That's why we had taken the small efforts in transferring the knowledge about drought and its management from one generation to another. Use of these strategies really important for the Farm management. It's a very small contribution to carry this information towards the farmers.

### **REFERENCES**

Reddy S. R. - Principles of Agronomy (6) Ludhiana: Kalyani publisher; 2019