

Editorial - I

Drought concerns and its management in agriculture

In the report on Trends in Sustainable Development of the United Nations, it is mentioned that from 10 world top natural disasters during the years 1974-2007, at least 5 had been due to drought. Drought is widely recognized as a slow creeping natural hazard that occurs as a consequence of the natural climatic variability. In general, the drylands –areas that have an annual deficit in precipitation – are more drought-prone than humid lands. In the drylands, semi-arid areas which are usually more populous and home to greater economic and social activity, suffer more from drought. In India, 330 million people were affected by the drought of 2015–16. Droughts are the main cause of severe food shortages and affect all dimensions of food security, including availability, stability, access and use, triggering malnutrition and famine.

In recent years, concern has grown worldwide that droughts may be increasing in frequency and severity given the changing climatic conditions. Responses to droughts in most parts of the world are generally reactive in terms of crisis management and are known to be untimely, poorly coordinated and disintegrated. Consequently, the economic, social and environmental impacts of droughts have increased significantly worldwide. Some direct impacts of drought are reduced crop, rangeland, and forest productivity; reduced water levels; increased fire hazard; reduced energy production, reduced opportunities and income for recreation and tourism, increase livestock and wildlife death rates; and damage to wildlife and fish habitat. A reduction in crop productivity usually results in less income for farmers, hunger, increased prices for food, unemployment and migration.

According to the Intergovernmental Panel on Climate Change (IPCC), a warmer climate, with its increasing climate variability, will increase the risk of droughts. The number of extreme drought events

per 100 years and mean drought duration are likely to increase by factors of two and six, respectively, by the 2090s.

Droughts differ from one another in three essential characteristics: intensity, duration, and spatial coverage. Intensity refers to the degree of the precipitation shortfall and/or the severity of impacts associated with the shortfall. It is generally measured by the departure of some climatic parameter (e.g., precipitation), indicator (e.g., reservoir levels) or index (e.g., Standardized Precipitation Index) from normal and is closely linked to duration in the determination of impact. Another distinguishing feature of drought is its duration. Droughts usually require a minimum of two to three months to become established but then can continue for months or years. The magnitude of drought impacts is closely related to the timing of the onset of the precipitation shortage, its intensity, and the duration of the event. Droughts also differ in terms of their spatial characteristics. The areas affected by severe drought evolve gradually, and regions of maximum intensity (i.e., epicenter) shift from season to season. From a planning perspective, the spatial characteristics of drought have serious implications.

For effective drought management in agriculture, it is important to address the following strategies:

- Assisting farmers in coping with drought through implementation of effective Drought Early Warning and Information Systems. There are numerous natural indicators of drought that should be monitored routinely to determine drought onset, end, and spatial characteristics. Effective drought early warning systems must integrate precipitation data with other data such as streamflow, snowpack, ground water levels, reservoir and lake levels, and soil moisture in order to assess drought and water supply conditions.

- Improving land, water and forest management through implementation of strategies for water conservation and water use efficiency; managing coastal ecosystems; and improving management of forests.
- Enhancing drought preparedness and mitigation by ensuring that technologies, measures and practices adapted to drought conditions are freely available.
- Adoption of effective policies that engender cooperation and coordination at all levels of government in order to increase the capacity to cope with extended periods of water scarcity in the event of a drought. The goal of the national drought policy is proactive mitigation and planning measures, risk management, and public outreach and resource

stewardship. The national drought policy should include the following steps: i) promote standard approaches to vulnerability and impact assessment; ii) plan and implement drought monitoring, early warning and information systems; iii) enhance preparedness and mitigation plans and programmes; and iv) plan and implement emergency and relief measures. The goal also includes incorporation of comprehensive governmental and private insurance and financial strategies into drought preparedness plans.

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