

Drought Assessment

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Preface

Climate is one among the triggering factors for drought and the geographical location of its occurrence coincides with earth's climatic classification. Experts provide varied definitions according to viewpoints based on selective parameters. Drought events that were reported from various parts of the world and their intensity are widespread. Forecasting of drought is general but it is looked from different perspectives by different experts. The first chapter of this book illustrates the abovesaid aspects. Understanding of the precipitation, cloud, weather, monsoon, tropical conditions, different type of weather forecasting, rainfall measurement and methods of analysis which offer greater insight of the drought initiation and preparedness activities, is given in Chapter 2 on Meteorology. Surface water from river, lake and ponds (natural or man-made) and ground water from hard and soft rock aquifer are the sources for supplementary irrigation when there is no rainfall. The quantum of water availability for supplementary irrigation from a source and its sustainability prior to decision making have been dealt in the third chapter. Crop growth and production depends on the suitability of crops for available soil type, seed quality, water and micro level humidity/temperature condition that favours the growth of pests. Chapter 4, Agriculture, discusses soil moisture holding capacity of the soil and crop water requirement for planning purposes.

Studies have shown that initiation of drought has certain relationship with the inducing parameters of a given test site. Threshold values of those parameters with reference to meteorology, hydrology, agriculture, socio-economics and environment and their classification were indicative of the forthcoming events. These indicators are being used for declaration processes across the globe. Analytical methods (statistical/mathematical) are extensively used in identifying the indicators. Some of the significant methods are discussed in the next chapter, Drought Indices. Remote sensing data offer information about the object without touching it with the help of electromagnetic spectrum. Sensors from air-borne and satellite-borne platform provide enormous information about the land cover features on a regular

basis. Data collection platforms, and visual interpretation digital image enhancement techniques that are being used for assessment of drought indicative parameters are discussed in Chapter 6 on Satellite Remote Sensing. Integrated analysis of observational data needs to be brought into a common domain prior to analysis. Chapter 7 elaborates creation of spatial data base from the conventional to recent collection modes and their analysis aspects under title Spatial Data and Geographical Information System. Creation of information base from the historical events and adopted management techniques is an important aspect in the knowledge based decision making and scenario creation at sites.

Risk from the drought events are not only due to lack of resources, crop production, people, livestock and economy but also social network. Information on drought vulnerability on micro and macro levels is effectively used in management of resources. Vulnerability Assessment, Chapter 8, highlights the vulnerability and risk assessment of various sectors. Vulnerability of revenue villages under a given rainfall scenario offer preparedness exercise. An overview of the drought affected countries in tropical and non-tropical regions, their natural resources and on-going management practices, collated from other sources is presented as Resources, Drought Events and Management Profile of Countries as last chapter of the book. In order to meet the natural hazard events, the available resources need to be effectively utilized.

It was possible to provide desired information at one place only with the support from Indian Meteorological Department; Central Water Commission; Indian Council of Agriculture Research; Central Research Institute for Dry Land Agriculture, Hyderabad; Central Arid Zone Research Institute, Jodhpur; Census of India; National Bureau of Soil Survey and Land Use Planning, Nagpur; Geological Survey of India; Ground Water Survey Board; drought monitoring centres and Indian Space Research Organization located in India and International Water Management Institute; UNEP/GRID; UNOSAT; Bureau of Meteorology, National Land and Water Resources, Government of Australia; Bangladesh Agricultural Research Council; Environment Canada; Alberta Agriculture, Food and Rural Development, Canada; China Meteorology Agency (CMA); National Oceanic and Atmospheric Administration (NOAA); US Department of Agriculture (USDA); US Geological Survey (USGS); National Drought Mitigation Center and others whose help is acknowledged.

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Trust this book would make a difference in the decision making in drought related activities.

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R. Nagarajan

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