

THE USE OF REMOTE SENSING DATA FOR ASSESSMENT AND MONITORING OF DROUGHT-RELATED SURFACE WATER STRESS IN UGANDA

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Drought is a recurring climatic event. Droughts often hit various climatic regions of Uganda, bringing significant water shortages, economic losses and adverse social consequences. The ability of the governments and international relief agencies to deal with droughts in Uganda is, however, constrained by the absence of reliable data, information networks, as well as professional and institutional capacities. The traditionally cattle keeping areas are worst hit as the surface water stress becomes a common phenomena. At present, Uganda has limited institutional and technical capacity to prepare for drought and mitigate its impacts.

This main objective of this study was to develop an early warning system using drought-related characteristics of surface water stress, which are derived from remote-sensing data. The indices include a deviation of current normalized difference vegetation index (NDVI) from its long term mean to determine water stress situation. This study investigates the observed pattern of droughts in the vulnerable regions of Uganda using Dekadal AVHRR satellite data from FAO Global Information Early Warning System (GIEWS). Droughts in recent years were studied using 10-day time-interval AVHRR satellite images available from year 2003 onwards.

The unique feature of the study is the development of regression relationships between drought-related indices obtained from AVHRR data, which have reasonable optical characteristics. The results of this study are being used for the development of a national drought-monitoring system in the regions experiencing water stress. Considering the spread and frequency of droughts in the country on the one hand, and the lack of ground climate observations and technical capacity in the country to deal with droughts on the other, such a system could play an invaluable role for drought preparedness.

In conclusion, this study observed that analysis of hazard such as drought and corresponding water stress is a complex task, as many factors can play important role in the occurrence of this disastrous event. It requires a large number of input parameters and techniques of analysis that are very costly and time consuming. The increased availability of Remote Sensing data and GIS during the last decades has created opportunities for a more detailed and rapid analysis of natural hazard including droughts. Therefore, a proper structure of information system for disaster management should be in place to tackle the disaster and manage it.