

An approach to integrate spatial and climatological data as support to drought monitoring and agricultural management problems in South Sudan

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Drought is a natural hazard characterized by an abnormally dry event in the hydrological cycle caused by insufficient precipitation over an extended period of time, which affects more people than any other natural disaster and results in social, economic and environmental costs.

In Africa, the economic system is based primarily on natural resources for example farming. For this reason, climate variability and events such as drought are phenomena that can represent significant disturbances and threats in the agricultural systems.

In particular, this study concerns the monitoring of environmental changes in the south sector of South Sudan. The climate and environment in the South Sudan have shown localised changes during the course of this century and recurrent wars and droughts in the last years determined a large food-crisis. Actually, the security situation is stabilised with sporadic fighting concentrated in Jonglei, Unity and Upper Nile States. With the stabilisation of the conflict, many refugees have returned to their regions, trying to recover the economic structure based mainly on agriculture. For this reason, it is important to monitoring and analysis the vegetation and drought trend over the last years to support agricultural development and food security, in particular in post-conflict areas.

This study focuses on the analysis of the relationship between the temporal variations of state of vegetation and the precipitation patterns. A historical analysis of the vegetation behaviour (NDVI) and the drought during the year is developed. In addition, with the aim to identify the wet and dry seasons, an analysis of precipitation is performed. Based on the vegetation and precipitation trends obtained, it is possible to characterize the best areas to start an agricultural system, giving priority to certain areas in order to plan the land use for agricultural purposes and programming crop (which and where). Consequently, with the aim to identify possible humanitarian emergencies, the precipitation is used to monitoring potential drought events in the critical periods of the year.

The methods employed and integrated different satellite data (Landsat and NASA-TRMM) in order to generate a proper database for the analysis of the seasonal movements according to climatological variations. Preliminary results will be presented and discussed.