Application of Remote Sensing Techniques to Assess Land Use Changes in Western Gedarif State, Sudan

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Abstract

Gedarif is one of the most promising states pertinent to food and cash crops production in Sudan. Despite that, it is also considered as one of the most fragile areas with regard to land degradation, desertification and drought risks. The state depends heavily on large-scale agricultural production particularly the largest mechanised rain-fed schemes with annual rainfall amount sufficient partially to secure production of food and cash crops. Most of agricultural lands in the area are classified as mixed savannah-woodlands that for provide transhipment pastoralists with palatable grasses.Conflict between Eritrea and Ethiopia, as well as the civil wars in eastern Sudan,have led to over-exploitation of land use as a result of the expansion of mechanised agriculture, over-cutting, overgrazing and expansion of residential refugees' camps. The paper aims to assess land use changes in Western Gedarif State, Sudan via application of remote sensing techniques. Moreover, the paper was also intended to identify the main factors and drivers affecting changes in vegetation cover in the study area. The paper used two land sat images for the period 1999 and 2013. The subset images were analysed and classified using supervised and unsupervised classification approach. The result of paper induced that land use changes was man made through mechanised farming and shifting cultivation and the urbanisation activities. In addition, it was demonstrated that the application of remote sensing technology is an efficient method to be applied for detection of land use changes in the study area.Furthermore, the linkage between the remotely sensed data and the field observations provided strong arguments that changes in land use patterns, which have led to degradation in vegetation cover in the study area.

Keywords: Human activities, land use changes, supervised classification, western Gedarif State

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