

Research Application Summary

The impact of human practices on environmental degradation and desertification in Alfula locality of West Kordofan State, Sudan

Kalthoum, E.D.A.¹ & Hamdon, A.A.²

¹Faculty of Natural Resources and Environmental Studies, Faculty of Forestry, Peace University

²Department of Forestry and Range Sciences, University of Kordofan, Sudan

Corresponding author: hamdonun2012@gmail.com

Abstract

The aim of this investigation was to assess the impact of human practices on environmental degradation and desertification in Alfula locality in West Kordofan, Sudan. The data used in this study were collected through focus group discussions, observations and several site visits. Secondary data were used to supplement the primary data. The study revealed that there are many tree species that have disappeared or reduced in the study area, among them species producing gum Arabic (*Acacia Senegal*). The presence of invader shrub species was also observed. Investigations on human practices on the environment concluded that, the agricultural practices characterized by applying inappropriate farming methods with agricultural expansion has led to environmental degradation and biodiversity loss. This increasing horizontal expansion of farms has destroyed most of pastureland, and the seasonal grazing lands have shrunk. The study recommends that, to reduce environmental degradation caused by deforestation and to protect the threatened ecological zone, suitable tree species should be introduced, grown and protected. Moreover, the existing rules and policies of forest conservation should be implemented.

Key words: Environmental degradation, expansion of farms, pasture land, West Kordofan

Résumé

Le but de cette enquête était d'évaluer l'impact des pratiques humaines sur la dégradation de l'environnement et la désertification dans la localité d'Alfula. Les données utilisées dans cette étude ont été recueillies à travers des discussions de groupe, des observations et des visites de sites. Par ailleurs, des données secondaires ont été aussi utilisées. L'étude a révélé que de nombreuses espèces d'arbres ont disparu ou sont limitées dans la zone d'étude, notamment celles produisant de la gomme arabique (*Acacia senegal*). La présence d'espèces envahissantes a également été observée. Les enquêtes ont permis de conclure que les pratiques agricoles caractérisées par l'application de méthodes agricoles inappropriées avec l'expansion de l'agriculture avaient entraîné une dégradation de l'environnement et une perte de biodiversité. Cette expansion croissante a réduit la plupart des zones de pâture. L'étude recommande que, pour réduire la dégradation de l'environnement et protéger les zones écologiques menacées, des espèces d'arbres appropriées soient introduites, cultivées et protégées. En outre, les règles et les politiques existantes en matière de conservation des forêts doivent être mises en œuvre.

Mots clés: dégradation de l'environnement, expansion des fermes, pâturages

Background

Sudan encompasses different climatic zones ranging from arid and semi-arid in the northern part to the dry sub humid in south. All these ecological zones are likely to be affected by desertification, which results in environmental degradation which is a constraint to attaining sustainable development. Most of the threats to the ecosystems are caused by climatic and human factors. The combination of these two causes has resulted in a fragile ecosystem, developed under harsh and fluctuating climate and human activities, some of which have been increased to an irreversible magnitude as a result of weather fluctuation, especially droughts which are irregular and unpredictable. Moreover, Khairalseed (2015) indicated that the high inconsistency of rainfall and the vulnerability of ecosystems to desertification could be the main causes of environmental degradation and desertification in Sudan.

According to Elhag (2012), desertification has threatened all parts of the country, particularly the irrigated farming sector where mechanized crop production schemes and the traditional rain-fed agriculture are practiced. Moreover, desertification is threatening almost all the potentially cultivable land in the Sudan. Likewise, forest lands over the country, especially the gum Arabic production belt in Kordofan, are threatened by desertification to a very large extent, which has affected the country's economy.

The phrase 'environmental degradation' has been defined widely in many ways. Degradation means changes in both quantity and quality of the environment which include the decrease in vegetation cover and losses of biodiversity (Choudhary, 2015). Another concept of land degradation was illustrated by Singh (2009), who in his investigation indicated that land degradation implies a reduction in rank or status, for example, a degradation and/or loss of soil, or a change to a simpler floral, faunal composition or a substitution of organic matter. The main aim of this investigation was to assess environmental degradation as a result of human activities in Alfula town in West Kordofan State, Sudan.

Methodology

Study description and data collection. This study was conducted in Alfula West Kordofan State. It is located between longitudes 27.30° and 32.00° E, and latitude 09.20° and 14.50° N, and bordered by North Kordofan State on the North, South Kordofan State on the East, East Darfur States on the West and South Sudan on the South, It is worth to mention that 85% of the population were nomads while only 15% were settlers based on 2010 census (Foula Statistics Centre, 2015). To collect the information, the research relied on observations, focus group discussion and field visits to study sites. To obtain the primary data, the published and unpublished sources, such as books, journals, reports and websites were reviewed.

Results and discussions

Change in tree population. The indications of change in tree cover comprises disappearance of some trees, especially *Accacia senegal* where some trees were reported to have declined in number by the communities. The study also noted the increased spread of shrubs, and decrease in diversity of trees species. The field survey and observation clearly indicated that some trees had disappeared and some are decreasing in number in the study area, such other disappearing species included; *Maerua crassifolia*, *Detarim microcapum*, *Accacia albida*, *Balanites aegyptiaca* and *Lannea fruticosa*.

The study also observed that some trees had become very rare such as *Combretum glutinosum*, *Combretum hartmannianum*, *Commiphora Africana* and *Guieva senegalensis*. Investigation on human practices on the land indicated that agricultural practices characterized by applying inappropriate farming methods, and the increased trends of horizontal land expansion for cultivation had resulted in environmental degradation and biodiversity loss. The horizontal expansion had destroyed most of pasture land and converted large areas to agriculture land. This has decreased the available pasture resources which has led to overgrazing and consequently resulted in forest degradation and reduction of the tree cover in the area.

Conclusions and recommendation

The study focused on the major indicators of environmental degradation and their effect on land degradation as a result of human activities in the study area. Many species were observed to have disappeared and such species included *Maerua crassifolia*, *Detarimmicrocapum* and *Accacia albida*. Notably, some trees had become very scarce, for instance *Ombretum hartmannianum*, and *Commiphora Africana*. The study also noted that some tree species had become dominant like *Ziziphus spinachristi* and *Leptadenia pyrotechinca* which reflects decrease in biodiversity. Decreased and the disappearance of important grass species like *Blepharis* sp. and *Z. diphylla* is a big threat to the grazing community. These grasses are known to be of high nutritional value and palatable for grazing.

The study also noted that shrub species had replaced trees and grasses and most land that was in the past covered by the *Acacia Senegal* had reduced. Other low value species for grazing not previously in the habitat, such as *Zorina diphylla* and *Prosopis glandulosa* had appeared. The appearance of termites around trees stems was a clear indication of degradation in Alfula area. The study recommended that, to reduce the environmental degradation due to deforestation and land degradation, there is need for policy intervention to protect the threatened ecological zones through afforestation and reseedling with suitable tree and grass species. Moreover, by laws and policies of forest conservation should be implemented.

Acknowledgement

The authors thank Dr. Hamdon Ali for his supervision. Peace University Department of Forestry for supporting this study. We further thank the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) for the financial support to present this work during the Sixth African Higher Education Week and RUFORUM 2018 Biennial Conference.

References

- Choudhary, M.P., Chauhan, G.S. and Kushwah, Y.K. 2015. Environmental degradation: Causes, impacts and mitigation. <https://www.researchgate.net/publication/279201881>.
- Elhag, E.A. and Elnasihk, M.H. 2012. Using of different fertilizers with woody legumes to recover decertified land. Research Institute (DRI) Annual Scientific Report, National Centre for Research, Khartoum, Sudan.
- Khairalseed, A.R. 2015. Desertification in Sudan, concept, causes and control. *ARPN Journal of Science and Technology* 5 (2): 87 – 91.
- Singh, K. 2009. Environmental degradation and measures for its mitigation with special reference to India's agricultural sector. *Indian Journal of Agricultural Economics* 64 (1): 40-61.