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IMPACT OF REFUGEE SETTLEMENTS ON LAND DEGRADATION IN UGANDA

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Abstract: In an effort to examine various drivers of land degradation in refugee settlement in Uganda, the study titled ‘Impact of Refugee Settlement on Land Degradation in Uganda’ was conducted where Pressure-State-Response Framework was used to analyze the current state of land, the main drivers of land degradation, and responses to the identified drivers in Bidi Bidi refugee settlement in Uganda. Findings of the study revealed that the increase in the refugee population has led to a loss of grasslands, croplands and woodlands in the refugee settlement. The most degraded land types were grassland, woodland, and cropland. This was primarily attributed to unending human pressure of cutting trees for firewood or sales, bush-burning, mono cropping, over cultivation and building of infrastructure such as roads and urban centers which exerted pressure on the land leading to land degradation. Responses to these pressures have been implemented by different actors including the government of Uganda, community groups, humanitarian agencies and households. This study recommends implementation of sustainable land management practices, enforcement of government policies and increased awareness on the impacts of human activities on land.

Keywords: *Refugee population, settlement, land, main drivers, degradation, Uganda.*

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INTRODUCTION

Uganda has demonstrated a commendable history by hosting a significant number of refugees from the neighbouring nations affected by persisted violence and conflicts. For instance, political instability in Democratic Republic of Congo, South Sudan, Burundi, and Ethiopia is contributing to a drastic increase in the refugee population in Uganda [1, 2, 3].

As of October 2023, a total of 1,583,009 refugees and asylum seekers live in Uganda [4]. About 48% of the refugees in Uganda are living in poverty, with West Nile region experiencing the highest rate, [5].

Due to this high refugee population and increased demand for natural resources to meet their needs, the area faces severe land degradation, [6]. These economic challenges faced by refugees, compounded by severe food insecurity intensify the environmental impact on the already fragile ecosystems. The dependence on wood fuel for energy contributes to deforestation and land degradation, [5]. The 40% cut in food aid by the World Food Programme has further contributed to the existing challenges. As the refugees struggle to meet their needs, they unsustainably use land resources. There are rising concerns regarding the possible effects of refugee communities on Uganda's natural resources since many of them are situated near some of the country's most environmentally sensitive places, [7]. The pressure on natural resources not only impacts the well-being of refugees but also has environmental consequences such as land degradation. As the number of refugees continues to rise, it is important to understand context of their impact on land degradation in Uganda. Land degradation is defined as a negative shift in land condition, because of direct or indirect human-induced activities such as deforestation, overgrazing and bush burning. The settlement of refugees poses significant effect on Uganda's land resources given the small size of land allocated to each household measuring 30×30 square meters, [8]. When displaced people move into wooded regions and build up communities there, it often results in a wide variety of environmental problems, most notably the destruction of the forest, [9]. It also results in deforestation and the conversion of wooded land for agricultural use or habitation. Such actions destroy natural resources resulting in loss of vegetation cover, [10]. Thus, it is crucial to address land degradation in the context of refugee settlements. Not only is this necessary for the preservation of Uganda's natural resources, but also for reducing degradation of land, [11]. To achieve a balance between protecting the critical forests and their inhabitants, while simultaneously providing housing for refugees, Uganda requires the implementation of environmentally responsible land management practices and conservation activities. However, there have been many interventions in the form of direct aid, skills training, forest regeneration, solar systems and improved cook stoves to reduce land degradation. Despite these efforts, the degradation of land in Bidi Bidi refugee settlement continues. Therefore, there is need to examine various drivers of land degradation in this refugee settlement in Uganda so that viable solutions can be suggested to conserve, protect, and restore land resources in the area. Therefore, the findings of this study would contribute to addressing the knowledge gap on the impact of refugee settlement on land degradation particularly as it pertains to grassland, woodland, and cropland.

It may also help local authorities and National government agencies such as National Environmental Management Authority (NEMA) and Ministry of Environment and Energy to improve on management of land by regulating refugee activities in a way that they sustainably use nature resources within the refugee area. Again, it would also help the government and stakeholders to plan and budget for land use management.

In addition, it may inspire organizations and development partners to ensure that means to conserve, restore and maintain land are improved, maintained, and strengthened, [12]. Nevertheless, the following research questions were formulated as guides to achieving the main objective:

- a) What is the current state of land in the refugee settlements in Uganda?
- b) What are the main drivers of the land degradation in the refugee settlements in Uganda?
- c) What are the responses to the identified drivers of the land degradation in refugee settlements in Uganda?

Conceptual Framework

The Organization for Economic Cooperation and Development (OECD) created the Pressure-State-Response conceptual framework for impact analysis to improve the provision of essential information for evaluating and analyzing environmental management [13]. The Pressure-State-Response framework is widely used as a means of reporting to describe the activities of humans that put pressure on the environment, altering the quality and quantity also known as, the state of natural resources, [14]. It examines the intersections in the three domains of pressure, state, and responses. It comprises of indicators for actions that cause environmental pressures, the status of the environment that may be affected by these activities, and societal responses, [15]. Factors like population increase and urbanization cause an increase in human resource extraction from the natural environment and discharge of waste into the ecosystem. At the same time, changes in the natural environment have an impact on human activity so as a result, humans take appropriate precautions to respond to its changes, [16].

METHODOLOGY

Study Area

Bidi Bidi settlement is located in Northern Uganda, Yumbe District as shown in Figure 1. The settlement covers 764 km², 32 % of the total land area, [8].



Fig. 1. The location of Bidi Bidi refugee settlement in Uganda, [17].

Approaches Used in Literature Search

The approaches used in literature search were based on a review of the literature on the impact of refugees on land degradation. There was insufficient time and resources to acquire primary data; hence, none was collected. Multiple search engines, including Google Scholar, Scopus, and Oria, were utilized to search for literatures. Multiple search options were employed to gain access to a broader range of information and discover information not available on other search engines. A keyword search was conducted within the search engine using phrases such as (“Refugee settlement or camp or crisis and land degradation) AND Impact,” “Refugee and Asylum seeker Population AND Uganda.” Articles, reports, books, and case studies related to the issue were downloaded, reviewed, and incorporated in the study based on the search results. Literature that was not published in English or that was published between 1990 and 2013 was removed. Only two essential literature materials out of twenty-six were consulted. This implies that approximately 92.3% of the references predominately were between 2017 and 2024. This was done to provide current information about the study. Articles that did not include “refugee settlement, vegetation, forest, and land use” were also eliminated. Although electronic databases are critical for ensuring reliable data, they were not a solution for all problems. The researchers also got information from reports and websites of development organizations such as the United Nations High Commissioner for Refugees [UNHCR] and Food and Agricultural Organization [FAO]. The review was guided by two potential links between refugee settlements and land degradation which include: plant cover and land use.

RESULT AND DISCUSSION

The study used the Pressure-State-Response framework which provided foundational conceptualization of the impact of refugee settlement on land degradation and entry point for analysis.

It recognizes human activities such as wood cutting for cooking fuel and sales, creation of settlements, land clearing for agriculture and loss to fires through bush burning which exert pressure on key aspects of land resources. A typical example is shown in Figure 2. The government, humanitarian agencies and communities have responded to the land state changes with various interventions, for example tree planting.

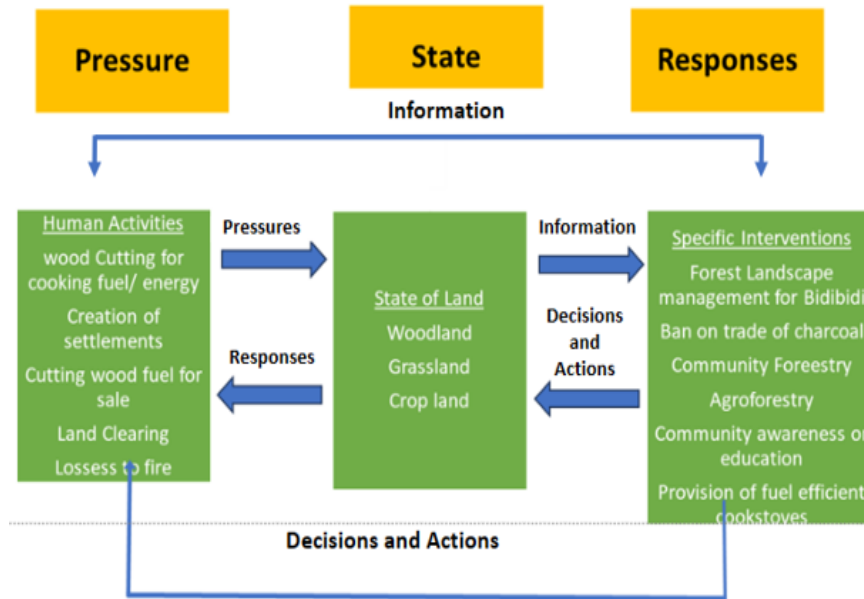


Fig. 2. Pressure-State-Response Framework of Bidi Bidi refugee settlement in Uganda

The State of the Land

The Land Area

Bidi Bidi refugee settlement was divided into five zones. Each zone contains residential and agricultural regions, as well as a small market, a health center, and schools, [18, 8].

Description of the State of Land Change

(a) State of Wood Land

Wood land was found to be highly degraded with reduced forest/tree covers, lost habitat for some animal species and limited regenerative capacity of some plant species [6]. Before the creation of the settlement, the area had dense vegetation cover. After the creation of the settlement, wood land decreased from 97.5% to 42.1% between 2015-2019, [12].

(b) State of Grassland

Grassland in Bidi Bidi refugee settlement was degraded. Some of the area became bare and with reduced vegetation cover, [19]. Before the creation of the refugee settlement, the area had high grassland cover of up to 81.2% and thereafter reduced to 39.0% between 2015 to 2019., [12].

(c) State of Cropland

The cropland became degraded. Crop yield reduced, soil became more eroded and there was increase in infestation of pests and diseases. This was attributed to over cultivation because of the small size of land measuring $30 \times 30 \text{ m}^2$ which is not enough, [8]. Cropland coverage increased from 4.6% in 2015 to 16.9% in 2019., [12]

However, a typical breakdown of land use classes inside the main settlement perimeter and within authorized residential zones in the Bidi Bidi refugee settlement is given in Table 1.

Table 1. Percentage breakdown of land use classes inside the main settlement perimeter and within authorized residential zones in the Bidi Bidi refugee settlement

Land Use	Land Area (%) in 2015 (Before Establishment)	Land Area (%) in 2019 (4 Years After Establishment)
Large Settlement Boundary		
Urban Area	3.4	6.7
Cropland	4.6	16.9
Grassland	67.4	69.2
Shrub/Forest	24.7	7.2
Shrub/Forest Grassland	92.0	76.4
Within the Settlement		
Urban Area	1.8	32.6
Cropland	0.7	25.4
Grassland	81.2	39.0
Shrub/Forest	97.5	42.1

Source: Nakalembe *et al.*, [12].

The Pressures on Land

(a) Wood Cutting for Cooking Fuel/Energy and Sales

The demand for cooking fuel in Bidi Bidi in the form of firewood and charcoal was high and this was attributed to the local cooking methods used by refugees, for example three-stone open fire and improved mud-stoves [20]. For this demand to be met, refugees cut wood and shrubs leaving the land bare. More than 90% of the people in Uganda rely on wood and charcoal to meet their domestic fuel consumption needs [6]. This has resulted in rampant destruction of forests to procure wood and charcoal as essential livelihood commodities. Northern Uganda refugee population data for April 2019 showed a total firewood consumption of 149,262 metric tons per year in Bidi Bidi settlement [20]. Selling wood fuel is one of the income-earning activities carried out in Bidi Bidi [19].

(b) Land Clearing for Agriculture

Upon arrival in Bidi Bidi settlement, each refugee household is allocated a small piece of land ($30 \times 30 \text{ m}^2$) by the Ugandan government to live and grow food, [21, 8].

Therefore, the refugees cleared woodland and grassland in search of bigger land for agriculture. Subsistence farming is majorly carried out [22]. Refugee homes in the Bidi Bidi cultivate a variety of crops, including sorghum, cassava, and peanuts, often known locally as groundnuts. The most common livestock constitutes 30% chicken, 28% ducks and 27% goats, [23].

(c) Wood and Land for Construction

The initial establishment of Bidi Bidi settlement in 2016 involved woodland and grassland clearing and the growing urbanization in the area showed increase in demand for land and materials like wood for building facilities, for example, shops and houses, [18]. The refugee households construct semi-permanent structures and improve their homes with latrines and kitchen shelters. Building materials used include wood, mud, grass, tarpaulins, bricks, and iron sheets (to a small extent). Exactly 30.2% increase in built-up areas in residential zones and 3.3% increase in the settlement boundary was noted in Bidi Bidi during the study period of 2015 to 2019, [12].

(d) Bush Burning

A positive relationship between the burned area and cropland area in Bidi Bidi has been shown because man-made fires are commonly used to clear new areas for land preparation and agriculture. Burning of crop residues after harvest has made fires more prominent within cropland areas than in natural vegetation. The majority of burned area was detected during and soon after the rainy season ended, that is; December to March, [12].

(e) Mono Cropping and Over Cultivation

Given the small piece of land allocated to refugees, single crops are planted during planting season to increase the quantity of yields especially for storable food crops like maize to ensure household food security, [21]. Constant cultivation of crop land leads to nutrient loss which encourage high use of fertilizers that causes soil and water pollution.

Responses

There have been many interventions that try to minimize the use of wood fuel by innovative methods and to conserve the forests by active engagement of the refugees.

(a) Responses Towards Wood Cutting for Cooking Fuel/ Energy and Construction

- (i) **Promotion of Planting of Trees and Establishment of Wood Lots:** In order to increase restoration of degraded woodland in Bidi Bidi refugee settlement, the government of Uganda and humanitarian agencies like UNHCR, World Vision have promoted planting of trees and establishment of wood lots, [24].
- (ii) **Encouragement of Planting of Fast-growing Tree Species:** Fast-growing tree species such as red gum and eucalyptus are encouraged to be planted in order to fill the gap and for the availability of wood in the settlement, [6]. Refugees are also equipped with knowledge and skills through training in tree growing and forest management.

(iii) **Provision of Energy Efficient Cook Stoves:** In order to achieve a reduction in biomass consumption for domestic cooking, interventions of providing energy efficient cook stoves to the refugees are performed. Refugees in Bidi Bidi are equipped with skills through trainings by organizations like Norwegian Refugee Council (NRC) [25]. Trainings include the construction of mud cook stoves which are energy efficient and produce less smoke thereby reducing effect on human health.

(b) Responses to Land Clearing for Agriculture/ Bush Burning

The following interventions were implemented to reduced pressure on land resulting from agriculture related clearing:

- (i) Sustainable farming practices like agroforestry, community forestry have been adopted in the settlement [25];
- (ii) Agroforestry restores forest land through natural regeneration and assisted natural regeneration of indigenous tree species. Community forestry models involve local people dominating the decision making in forest management [6];
- (iii) Advocacy by local government and community leaders to stop bush burning and slash agriculture [25];
- (iv) Regulatory interventions towards land conservation.; and
- (v) The Government of Uganda has laid statutes that dictate the allocation, use and management of land and resources by refugees [26].

CONCLUSION AND RECOMMENDATIONS

The high number of refugees in the Bidi Bidi refugee settlement has put more pressure on how the land is used, which has led to land degradation. The 30 × 30 meters square of land allotted to each refugee household is not enough to support their livelihoods and this has resulted into overuse of the land. The degradation of land in the settlement is due to unsustainable land management practices among the refugee households. Cutting of trees for fuel, bush-burning, mono cropping, over cultivation, expansion of land for agriculture and the construction of infrastructure such as roads and urban centers were the main drivers of land degradation in the settlement. The most degraded land types were grassland, woodland, and cropland which was evidenced by loss of forest cover, increased area of bare ground, increased soil erosion, and a limited capacity for natural vegetation to regrow, low crop yield as key indicators of land degradation. Responses to address land degradation in Bidi Bidi refugee settlement included regulations, implementing sustainable land management techniques, and raising public knowledge of the effects of human activity on the environment. To further reduce land degradation, the following recommendations were proposed:

- a) There is a need to promote sustainable land management measures in the current forest management plan;
- b) The study observed that implementation of existing land conservation policies in the refugee settlement is still lacking. Therefore, re-aligning existing policies to the existing land resource challenges and increasing awareness on conservation strategies among refugees are recommended;

- c) There is need for more sustainable agricultural practices to conserve the land while meeting human food needs; and
- d) Education on land management systems should be improved for refugees to understand how their activities affect land resources.

CONFLICT OF INTEREST

None is declared.

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UTICAJ IZBEGLIČKIH NASELJA NA DEGRADACIJU ZEMLJIŠTA U UGANDI

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Apstrakt: U nastojanju da se ispituju različiti uzroci-pokretači degradacije zemljišta u izbegličkim naseljima u Ugandi, sprovedena je studija : Uticaj naseljavanja izbeglica na degradaciju zemljišta u Ugandi, u kojoj je korišćen okvir pritisak-stanje-odgovor za analizu trenutnog stanja zemljišta., glavni pokretači degradacije zemljišta, i odgovori na identifikovane uzročnike-pokretače u izbegličkom naselju Bidi Bidi u Ugandi.

Rezultati istraživanje ove studije su otkrili da je povećanje izbegličke populacije dovelo do gubitka travnjaka, obradivih površina i šuma u izbegličkom naselju. Najviše degradirani tipovi zemljišta bili su travnjaci, šume i usevi.

Ovo se prvenstveno pripisuje neprekidnoj delatnosti ljudi, kao što je: seča drveća za ogrev ili prodaje, spaljivanja žbunja, monokulture, prekomerne obrade i izgradnje infrastrukture kao što su putevi i urbani centri koji su vršili pritisak na zemljište što dovodi do pojave značajne pojave degradacije zemljišta.

Odgovore na ove pritiske sproveli su različiti akteri, uključujući vladu Ugande, grupe u zajednici, humanitarne agencije i domaćinstva.

Ova studija preporučuje implementaciju prakse održivog upravljanja zemljištem, sprovođenje vladinih politika i povećanje svesti o uticajima ljudskih aktivnosti na osobine zemljišta.

Ključne reči: *Izbegličko stanovništvo, naselje, zemljište, glavni pokretači, degradacija, Uganda*

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