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Research Application Summary

Effect of refugees and host communities on the natural resource degradation: A case study on Hitsats Kebele, northern Ethiopia

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Abstract

Land based subsistent farming has been practiced in Ethiopia, particularly in the Northern parts where Eritrean refugees and host communities are many. Natural resource degradation due to recurrent cutting down trees for cooking and baking, traditional gold mining and expanding cultivation of crops is severe. To reverse the natural resource degradation and maintain sustainable socioeconomic development in Hitsats Kebele of Tigray regional State of Ethiopia, ZOA Relief Hope Recovery international, Ethiopia in collaboration with Aksum University has conducted a study to identify the effect of refugees and host communities on natural resources and propose best land use planning. The study was done in 2016 and employed household survey, focus group discussions, consultative meetings with sector offices, field measurements and GIS data analyses. Mixed crop-livestock production, traditional gold mining, small and medium enterprises are the main means of livelihoods for the host community whereas Eritrean refugees depend on rations from UNHCR, remittance and petty trade. In the existing land uses, soil erosion and deforestation are the major problems. Other means of livelihood for the host community households include selling of fuel wood. Similarly, these respondents reported that food security is not an issue for people who are in their productive ages and have land in the area. Financial limitation is said to be the main challenge for the refugee community to engage in viable businesses in the camp. Hence, there is need for interventions to improve the coverage and quality of soil and water conservation (SWC), plantation and area exclusion, create employment opportunities, enhance food security and income of both host community and Eritrean refugees while reducing burden on the natural resources.

Keywords: Area exclusion, Ethiopia, natural resources degradation, refugees, soil and water conservation

Résumé

L'agriculture de subsistance est pratiquée en Éthiopie, en particulier dans les régions du nord d'abondance des réfugiés érythréens et des communautés d'accueil. La dégradation des ressources naturelles due à l'abattage récurrent des arbres pour le chauffage, l'extraction traditionnelle de l'or et l'expansion des cultures a accru. Pour inverser les tendances et maintenir un développement socio-économique durable dans l'État régional de Hitsats

Kebele de Tigray en Éthiopie, ZOA Relief Hope Recovery international, Éthiopie, en collaboration avec l'Université d'Aksum, a mené une étude pour identifier l'impact des réfugiés et des communautés d'accueil sur les ressources naturelles et proposer un meilleur plan d'utilisation des terres. L'étude a été réalisée en 2016 et a utilisé une enquête auprès des ménages, des groupes de discussion, des réunions consultatives avec les bureaux sectoriels, des mesures sur le terrain et des analyses de données SIG. La production mixte agriculture-élevage, l'extraction minière traditionnelle, les petites et moyennes entreprises constituent les principaux moyens de subsistance de la communauté hôte, tandis que les réfugiés érythréens dépendent des rations du HCR, des envois de fonds et du petit commerce. Dans les types actuels d'utilisations des terres, l'érosion des sols et la déforestation constituent des problèmes principaux. D'autres moyens de subsistance comprenaient la vente de bois de feu. De même, les répondants ont indiqué que la sécurité alimentaire ne représente pas un problème pour les personnes en âge productif et qui ont des terres dans la région. Les contraintes financières constituent un principal défi pour la communauté des réfugiés de s'engager dans des entreprises viables dans le camp. Par conséquent, des interventions sont nécessaires pour améliorer la couverture et la qualité de la conservation des sols et de l'eau, l'exclusion des plantations et des zones, création des opportunités d'emploi, amélioration de la sécurité alimentaire et les revenus de la communauté d'accueil et des réfugiés érythréens tout en réduisant la charge sur les ressources naturelles.

Mots clés: exclusion de zone, Éthiopie, dégradation des ressources naturelles, réfugiés, conservation des sols et de l'eau

Introduction

With a population of more than 90 million, Ethiopia is the second populous country in Africa. It is a country of great geographical diversity that has high and rugged mountains, plateaus, valleys and vast plains. Its altitude ranges from the highest peak at Ras Dashen (4,620 meters above sea level) down to the Dallol Depression, about 120 meters below sea level. A large part of the country is comprised of high plateaus and mountain ranges dissected by streams.

According to the Ethiopian Ministry of Agriculture and Rural Development (MoARD, 2010), agriculture accounts for 90% of export volumes and contributes about 43% of the country's GDP. Endowed with wide-ranging agro-ecological zones, Ethiopia produces a wide variety of crops and livestock. Mixed crop-livestock agriculture, agro-pastoral and pastoral systems are the livelihood basis for majority of the population. Hence, land based smallholder subsistent farming has been practiced in the country for millennia. Natural resources degradation such as deforestation has been manifested for decades and has contributed towards climate change in form of droughts, flood hazards, irregularity in rainfall patterns as elsewhere in East Africa. Thus, efforts of achieving food security and poverty alleviation are being constrained. According to FAOSTAT (2016), a quarter of the Ethiopian population have faced food security and nutrition crisis as the country is stricken by the worst drought in decades.

On the other hand, Ethiopia hosts an enormous number of refugees who flow into the

country on a daily basis driven by social, economic and political factors. Immigrants from Somalia in the South-East, South Sudan in the West and Eritreans in the North cross into Ethiopia regularly. This huge number of refugees together with increasingly growing domestic population is causing a heavy burden on the physical environment (or natural resource) base of the country. Like in most parts of the country, the vast majority of the households in Hitsats rely almost entirely on biomass energy sources for their daily cooking and baking needs resulting into excessive cutting of trees for fire wood from public and privately owned forests (Fana, 2016). This creates conflicts and tension among refugees and the host communities. In addition, there is intensive traditional gold mining in Hitsats. This practice is regarded as second most important contributer to land degrading (Tesfay *et al.,* 2017). Therefore, the main objective of this study was to seek for alternatives that can reverse natural resource degradation, improve livelihood, social and environmental conditions. The specific objectives were to (i) identify the impact of refugees and host communities on natural resources in a semi-arid environment in Hitsats Kebele, Ethiopia, (ii) identify land-use problems and opportunities in Hitsats Kebele through community participation, (iii) identify key problems manifested on the surrounding environment in the host community due to Eritrean refugees in Hitsats, and iv) propose best land use plans that resolves conflicts within the host community and between the host community and refugees.

Materials and Methods

Description of the study area. The study was conducted in Hitsats Kebele (which includes Hitsats refugee camp) of Asgede-Tsimbla which is 45 km way from Shire Endaselassie North Western Tigray and 1152 km North of Addis Ababa. Hitsats Kebele is located at 37052'30'' to 380 0'30''E and 1408'0'' to 1401'03''N (Figure 1). The area is characterized by lowland semi-arid climate, undulating topography, and unregulated and intensive traditional gold mining. The altitude of the study area ranges from 892 to 1340 meters above sea level. The area is also infested with malaria. The area receives a mono-modal rainfall pattern with more than 90% received from June to September. The mean annual rainfall for the area is 630 mm. Similarly, the average mean maximum and minimum temperature of the study area for the past 19 years is 31.81^{0}C and 25.14^{0}C, respectively. Therefore, this area belongs to the Kolla (warm semiarid) agro-climatic zone (Alemneh, 2003). Representative samples of 86 households from host community and 96 from refugees were selected using systematic random sampling procedure and interviewed using a semi-structured questionnaire. Proportional sample sizes were taken in accordance with Yamane (1967) sample size determination technique. Collected data were organized in MS excel and analyzed using descriptive statistics such as mean, standard deviation and percent in SPSS 20. Focus group discussions were also undertaken to identify problems from both the host community and refugees.

Results and Discussions

Demography. Out of the total sample of host community respondents, 93.1% were male headed and the remaining 6.9% were female headed. On the other hand, of the total sample respondents of Eritrean refugees found at Hitsats camp 66.67% and 33.33% were male and female, respectively. The overall mean age of the host community and Eritrean refugees was

50 and 38 years, respectively, showing that Eritrean refugees were younger. The average family size of the host community respondents was 6.55 while that of the refugees was 2.58. With respect to the marital status of sample respondents, 97% of the host community and 25% of the Eritrean refugees were married (Table 2).

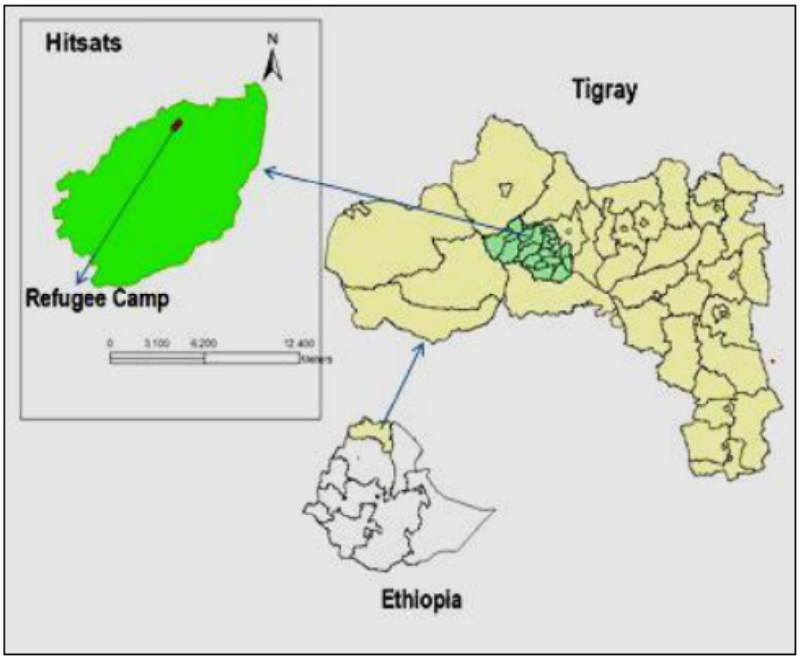

Figure 1. Location map of the study area

Table 1. Demographic characteristics (Sex, marital and educational status) of the respondents

Variable	Value	Host community (%)	Refugees (%)
Sex	Male	93.10	66.67
	Female	6.9	33.33
Marital status	Single	00	16.67
	Married	96.55	33.33
	Divorced	3.45	16.67
	Widowed	-	16.67
	Separated	-	16.66
Educational Status	Cannot read and write	34.48	8.33
	Can read and write	20.69	-
	Primary	34.48	25
	Secondary	10.35	58.34
	TVET	00	-
	College/University	00	8.33

With regard to educational status, 34.48% of the host community could not read and write, while 20.69% could read and write, 34.48% attended elementary level of education while the remaining 10.35% completed high school education. On the other hand, educational status of the sample Eritrean refugee respondents indicated that 91.67% attained at least primary level education (Table 1). The average time lived in the camp by the refugees was one year and eight months, indicating that they had lived there for a limited time.

Table 2. Demographic characteristics of the respondents

Variables			Host community		Eritrean refugees	
			Mean	SD	Mean	SD
Age			50	12	38	13
	Male	Below 15 years	1.71	1.12	0.64	1.21
		15-35 years	1.26	1.20	0.5	0.53
		36-64 years	0.64	0.49	0.3	0.48
		65 years and above	0.15	0.37		
	Female	Below 15 years	1.59	1.47	0.64	1.29
		15-35 years	1.15	1.20	0.58	0.79
		36-64 years	0.52	0.51	0.29	0.45
		65 years and above	0	0		
Family size			6.55	2.56	2.58	2.57
Years lived in camp			-	-	1.78	0.73

SD= stands for standard Deviation

Livelihood options. Despite recent developments in trade, services and small and micro enterprises (SME) resulting from urbanization, cultivation of crops and rearing livestock are the main means of livelihood for the respondent households in the host community. Gold mining and selling of fuel wood are the other sources of livelihood, especially for the landless rural youth. Unlike many other areas in the region, laboring and food for work are not used by the respondents of the host community. Food security was not a problem for people in their productive ages who owned land in the area. On the other hand, refugee respondents mainly depended on rations which include 15 kg wheat, 1 kg pulse and 1 liter oil. Refugee respondents complained about the inadequacy of the ration and shortage of cash to buy industrial products for their home consumption. Remittance and petty trade are being used to supplement the livelihood of the refugees. Inadequate financial capacity is the main challenge for the refugee community to engage in viable businesses. Only a negligible number (15 out of the total population) of the refugee respondents were involved in farming activities such as small scale chicken production and irrigation.

Existing land-use practices. Land is the main factor for production in the area. The total area of Hitsats Kebele is 10,557.64 hectares (ha), of which 4,019.94 hectare is cultivated land (Table 3). The average landholding is 2.58 hectares per household.

Table 3. Existing land-use cover at Hitsats

LULC* Name	Area coverage(ha)	Coverage (%)
Cultivated land	4,019.94	38.0
Forest land	3,813.98	36.1
Grass land	996.32	9.5
Bare land	1,120.64	10.6
Residential	606.76	5.8
Total	10,557.64	100

*LULC= Land use land cover map

(Source: generated from Landsat satellite image, 2016)

The existing land use and land cover of Hitsats is categorized as cultivated land, grassland, forest land, bare land and residential. Cultivated land accounts for about 38% of the total land area (Table 3 and Figure 4), although this is likely to reduce due to traditional gold mining activities, demand for land for settlement and population growth.

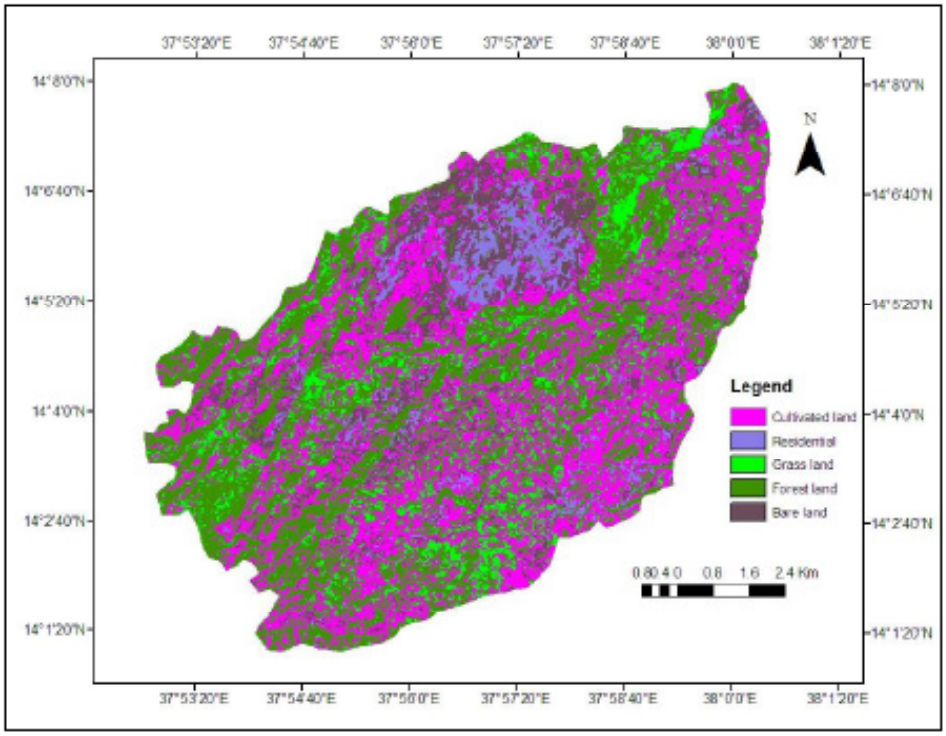

Figure 2. land use Cover map of Hitsats Kebele

This study identified several problems in the existing land-use including severe soil erosion, deforestation, and expansion of cultivated areas into hillsides, grazing lands and forests. Land degradation (erosion and deforestation) due to gold mining, fuel wood and expansion of cultivated areas is a result of population growth, domestic as well as international immigration. Similar to other areas in Tigray, land distribution was carried out 29 years ago. This was accomplished without clear border demarcations, except for natural features such as rivers and mountains. As a result, landholders have been continuously expanding their cultivated land at the expense of communal forest and grazing areas. This is aggravated by lack of soil conservation practices on private farmlands and the practice of free grazing. These have ultimately resulted into (i) unequal and unfair landholding among households, (ii) increasing number of landless households, (iii) natural resource degradation, and (iv) declining productivity of crop and livestock sectors.

Problems identified by more than 90% of the respondents from host community and refugees are categorized into three as severe, moderate and less severe. Deforestation, shortage of energy, soil erosion, lack of land-use plan and immigration are the main problems classified as severe. Table 4 summarizes the root causes and opportunities to tackle them. Respondents agreed that there is severe level deforestation due to unregulated gold mining, fuel wood consumption by households of host community, use in bakeries

and by refugees, free grazing and land clearing for expanding cultivation. Moreover, the main cooking fuels used by host and refugee households are firewood and charcoal. The vast majority of refugee households (96.3%) and host communities (100%) rely on firewood for cooking. Firewood is used in 98% of refugee households and host community households while charcoal is used by 96% (Fana, 2016).This showed that there is a high level of deforestation in the area. According to host community respondents, the main coping mechanisms being implemented against deforestation are distributing communal areas to the landless youth for better management and practicing agro-forestry. Promoting forest protection and plantation, electrification and other energy alternatives to replace fuel wood consumption and introducing energy saving technologies were mentioned as the main opportunities to reverse the trend of environmental degradation. Deforestation, in turn, compounded with unregulated gold mining, free grazing, expanding cultivation and lack of conservation on farmlands are resulting in severe soil erosion. This calls for regulated and improved mining, enhanced physical and biological soil and water conservation on both farmlands and communal areas. There is need to promote improved mining, intensive agriculture as well as small and medium industries that offer employment opportunities for the unemployed host and immigrants, will help and restore peace and stability. These require integrated participatory land-use plan. This was not available, and needs to be prioritized.

Table 4. Problems identified as severe by the host community

Problem	**Cause**	Opportunities
Low livestock productivity	Shortage of feed, water and communal grazing land due to expanding cultivation and degradation	Enrich grazing lands and promote backyard forage production, conservation and improve utilization; reduce livestock population and focus on few improved breeds with intensive management; purchase concentrate feeds
Unemployment	Landlessness due to high population; Eritrean and domestic immigrants; entrepreneurial skill and alternative due to poor governance; low awareness and motivation;	Promote good governance and entrepreneurships; capacity building and self-help group formation; re-distribute land fairly; introduce modern and legal mining techniques
Landlessness	Lack of land distribution while there is high population growth; Settlement, road and refugee camp construction; partiality	Mountain sharing and land re-redistribution
Security concern (peace and stability)	Immigrants; joblessness; alcohol abuse;	Community awareness, mobilization and policing; law enforcement
Water shortage	Arid climate aggravated by droughts, degradation and less efforts on water conservation and development	Prevent mining in rivers; promote rehabilitation (conservation and forestation), water harvesting and water development/structures.
Low income	Unemployment and low agricultural productivity	Create employments on intensive farming and modern mining

Different opportunities to solve the major challenges in the area were identified. These opportunities were evaluated and ranked in terms of sustainability, productivity, equality, social acceptability, technical feasibility, cost and time. They are outlined below:

Reversal of soil erosion. Participants of the focus group discussion and respondents of the household questionnaire survey suggested that soil and water conservation practices be promoted, gold mining on farmlands be legalized along with responsibilities for conservation, as well as introduction of technologies to accurately locate the mineral, in their decreasing order of importance, as solutions to control land degradation in the area (Table 4).

Natural Resources Management. According to Lemenin *et al.* (2005) land degradation in the form of deforestation, soil erosion and declining soil quality severely reduce agricultural productivity. Tigray region suffers from extreme land degradation and soil erosion due to cultivation of steep slopes that has been practiced for centuries (Tamene, 2005; Mekuria *et al.,* 2007). This study revealed a similar situation in Hitsats due to expansion of arable land to steep slopes, forests and grazing-lands, fuel wood consumption and traditional gold mining. Therefore, watershed based soil and water conservation (SWC) practices would provide an appropriate intervention to alleviate problems of erosion, deforestation, and low productivities of crop and livestock.

Conclusions

The level of soil erosion and deforestation in Hitsats Kebele is found to be severe due to expansion of cultivated area into hillsides, forest and grazing-lands, fuel wood consumption by the host community and Eritrean refugees, unregulated traditional gold mining, and free grazing of animals. Thus, crop and livestock productivity is significantly lower than the regional averages. This is aggravated by limited use of improved inputs and management practices. Erosion and low soil fertility status are the most limiting factors in the area. Therefore, the following recommendations are drawn from this study:

- Introduce more pronounced and effective techniques of soil and water conservation not only on hillside communal areas but also on private farmlands.
- Enclose degraded hillside areas for regeneration and use it as source of animal feed through cut-and-carry system.
- Promote plantating of multipurpose and indigenous plants in homestead backyards and communal hillside areas.
- Devise effective means of controlling illegal gold mining.
- Introduce appropriate monitoring and evaluation plans in the implementation of environmental impact prevention and mitigation measures planned.

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