THE MIGRATION-ENVIRONMENT NEXUS

The Situation in Northwest Uganda

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Table of Contents

List of tables

List of figures

Joel Adriko, a community mobilizer in ICRAF, holds up a seedling of *Combretum molle.* This indigenous species is the most heavily utilized for firewood in and around Rhino Camp and Imvepi refugee settlements. The photo was taken during an exercise to restore a stream bank heavily degraded by farming, brick-making and charcoal burning. It involved planting several hundred seedlings and pruning living tree stumps to encourage them to regrow (Photo Credit: ICRAF/Cathy Watson)

Executive Summary

In the last four decades, Uganda, Sudan, South Sudan and the Democratic Republic of Congo (DRC) have seen much transboundary human migration, largely forced movement due to conflict and political unrest.

In 1980 Uganda generated hundreds of thousands of refugees into Sudan and DRC, virtually all of whom had returned by 1988. Since then the country has been on the receiving end, welcoming Sudanese refugees in the mid-1990s, over one million South Sudanese since 2013, and many Congolese over the years.

The migration-environment nexus of greatest concern today involves the South Sudanese refugees, about 90% of whom now live in what was until their arrival a mosaic of grassland, woody savannah, open and closed woodland, and forest. They have cleared vast expanses of the land for homesteads and cultivation, and their very survival hinges on their ability to utilize trees for firewood, construction, fruit and other non-timber products. For water, they depend on boreholes and rivers, the sustainability of which also relies on healthy tree cover. The pressure on the environment is immense. Trees have vanished in many areas, with severe consequences for now and the future.

Stakeholders from local governments to international organizations have noticed the degradation but are hard pressed to fully grasp it conceptually and practically. This review aims to reduce that gap by examining the migration-environment nexus in Rhino Camp and Imvepi refugee settlements in NW Uganda. Its main conclusions are that:

- Refugees and hosts have immediate and on-going need for wood for cooking, shade and building. The inevitable intense pressure on natural resources must be addressed from the start of a refugee influx.
- Current humanitarian response focuses largely on short-term often life-saving actions and hardly considers, if at all, the environment that sustains populations. The environment itself is life-saving, however.
- Allowing the environment to deteriorate undermines life-saving and creates new threats. Environmental interventions and actors are vital in humanitarian settings.
- The status of a crisis or an emergency does not justify allowing degradation to worsen or set in.
- Agencies, non-governmental organizations (NGOs) and governments, particularly under-staffed and resourced local governments, need support and capacity development to safeguard the ecosystem services that sustain refugees and hosts. Likewise, these communities possess important knowledge and capacities but lack resources to manage the challenge on their own.
- Refugees and hosts can be incentivized to undertake environmentally-beneficial actions such as tree planting, assisted natural regeneration, and wiser use of natural resources, such as better planned, selective tree cutting and reduced wastage.
- Humanitarian response needs to embrace sustainable landscape management and restoration if need be, a paradigm shift that requires strong sensitization and partnerships to deliver.

Keywords: Migration; Refugees; Host communities; Environment; Humanitarian response; Incentives; Stewardship

Top: Being a refugee has not been easy. But Joseph Lukadi, 22, has carved out a life for himself. His family uses a sustainable cookstove introduced by GIZ ENDEV, which cooks beans in under two hours, far less than the previous three plus. "This saves firewood and we use the surplus money on other necessities like water" (Photo Credit: Arnold Nkatta)

Bottom: Kizito Drapari Achille manages an ENDEV energy kiosk in Imvepi refugee settlement. The kiosk supplies energy products (improved cookstoves, solar PV home systems, solar lamps) and services (phone charging, printing, copying, internet café services) (Photo Credit: Ben Butele)

Introduction

Numerous factors play key roles in forcing people to flee their homes and become refugees. The most prominent ones globally include conflicts and war, and natural calamities or disasters.

Globally, there are about 65.6 million forcibly displaced people (refugees, asylum seekers and internally displaced people) (UNHCR 2017). Of these, refugees make up close to a third. Close to 28,300 people flee their homes and are displaced every day. About 55% of global refugees come from South Sudan, Afghanistan and Syria, and more than half of the forcibly displaced people in Africa are from the Eastern and Horn of Africa region. The African continent hosts about 30% of the world's displaced people. This is a little less than the proportion hosted in Europe and the Americas, but more than the 26% hosted in the Middle East and North Africa. Two of the world's top refugee- hosting countries are in Africa – Uganda and Ethiopia.

Numerous factors play key roles in forcing people to flee their homes and become refugees . The most prominent ones globally are conflicts and war and natural calamities or disasters. Looking at the reasons in the top refugee-producing countries (South Sudan, Afghanistan and Syria), conflict remains the main driver for migration. Once people are displaced from their homes, their goal is to find a safer place where they and their families can survive. Although very often safety comes first in the choice of places to move to, availability of natural resources in the potential settlement area is also a key factor and determinant of how well they fare there. For agencies and governments seeking sites for refugees, the natural resource potential of an area is an important consideration. For example, it is easier to settle displaced people where they can access water. The alternative of supplying water to displaced people is very costly, although it also depends on refugee numbers.

Natural resources are required to meet immediate relief needs. If the carrying capacity of the hosting area is exceeded, unsustainable use of natural resources or poor environmental performance can trigger new sources of risk for the displaced people. Environmental issues directly affect core aspects of humanitarian work, particularly its quality and sustainability. For instance, the West Nile region supports refugees practising subsistence agriculture that is almost entirely rain-fed. With the impact of climate change, the rains are sporadic and unreliable, making crop farming risky. Negative environmental impacts threaten lives, health, livelihoods and security and could cause further direct damage to the environment. In humanitarian settings, relief and recovery operations can also exacerbate underlying environmental stresses; and problems caused by a high influx of people may result in exceptional constraints on the capacities of natural resources to deliver services to refugee populations, as well as to host populations, leading to competition for natural resources (Irish Aid 2007, UNDP 2017).

Areas hosting refugees are more vulnerable to shocks due to refugees' poverty in relation to that of the residents, the demands on already-stressed resources and/or services, and refugees' limited resilience (OPM 2016). For example, a recent report (World Vision 2017) observed vast tree felling in Rhino and Imvepi refugee settlements in Arua district for fuel consumption, creation of settlement areas and construction purposes in the settlements and surrounding areas. It raised the concern that the rate of tree harvesting was surpassing the regeneration capacity and, in a foreshadowing of what is happening today, that it was only a matter of time before the impact begins to be felt widely.

UNHCR 2017.
Figures at a glance.
http://www.unhcr.org/figures-at-a-glance.html For ease of reference in this document, all categories of displaced people are referred to as refugees.

Additionally, in refugee settlements, the demand for water still far exceeds supply. Limited water points create stress and conflict and lead to women and girls spending hours in lines waiting for water and walking long distances to find alternative sources if a point fails.

Giving due consideration to the environment in a humanitarian response can make a pivotal difference in the success of that response. Environmental stewardship during humanitarian action reduces conflict drivers and increases resilience. In Uganda, the government prioritizes environmental protection and mitigation measures in refugee-hosting areas. However, even in this progressive setting and despite this recognition, challenges in implementation abound and persist. Humanitarian efforts still largely focus on saving lives in an emergency context at the expense of stewarding the environment. The result is a lack of critical measures such as a catchment-based planning for long-term water infrastructure and a more sustainable supply of fuelwood. More planning and systems thinking, identification of key needs and issues, and cross-sectoral integration of environmental issues before and during humanitarian action can help close that gap.

The aim of this publication is two-fold: 1) Revisit the conceptual basis linking conflict and war, migration and environment; and 2) Examine the existing situation and highlight strategies for improving environmental management in humanitarian settings. The purpose is to generate recommendations to support implementation of essential environment-maintaining-and-sustaining refugee-hosting practices.

Conflict and its impacts on humanity and natural resources

Conflict emerges when actors have irreconcilable differences or incompatible interests, values, power, perceptions and goals. Furthermore, if unresolved or not managed, conflicts are likely to escalate and intensify (Castro and Nielson 2003; Yasmi et al. 2006; Bob and Bronkhorst 2010), depending on the divergent and sometimes opposing views about the common space shared by the opponents. The causes of conflicts vary across the globe, and their manifestations differ considerably. Many recent or ongoing civil wars are being or have been caused by economic and territorial gains, religion, and conflicts over natural resources among others. Causes are often numerous, and the reasons for a conflict can be intertwined in complex ways, rather than there being just one single clear cause. Whatever form conflict takes, however, it is likely to have multiple impacts (albeit at different geographical scales) that may include physical harm to both humans and the natural resource base and impact on productivity levels and economic development. The immediate impact of such events can be loss of human life, pollution, damage to the environment, such as loss of biodiversity and ecosystem function, and damage to essential infrastructure such as water and sanitation (Bob and Bronkhorst 2010; UNEP/OCHA 2014).

When people migrate due to conflicts, wars and other related challenges, it creates a labour shortage. In unstable environments, people are often reluctant to go out and work as it poses a security risk. Natural resources receive scant attention. Furthermore, young people who can leave tend to do so, triggering a shortage of labour for activities critical for natural resource management. Brain drain is another challenge.

Access to natural resources and assets is vital for livelihood security, especially in poor communities and households that rely directly on natural assets to ensure daily survival and livelihoods. In addition, the poor who remain reliant on the natural resource base in developing countries are most likely to be among the most severely affected. However, livelihood activities often destroy the natural resource base through over-use and degradation, which in turn contributes to desertification, deforestation, soil erosion, declining water tables and other types of environmental damage that affect livelihoods. The natural resource base is extremely vulnerable during instability, frequently becoming the focus of looting and exploitation (Bob and Bronkhorst 2010).

Joyce Kaku, 49, a South Sudanese refugee with two of her five chidren, displays a sack of kernels from the fruit of the shea butter tree. She travelled deep into the adjacent woodland to collect these important non-timber forest products. Referred to as Lulu in the various languages of South Sudan, the tree's kernels produce oil that can be used for cooking. The refugees and host nationals have almost encyclopaedic knowledge of the natural vegetation. ICRAF's forest inventory found 31 tree species with edible parts (Photo Credit: ICRAF/Cathy Watson)

Often, in vulnerable conflict-prone contexts where resources are limited, the lack of alternatives results in increased environmental degradation that leads to higher levels of poverty and risk, thus reducing livelihood options and food availability.

The resultant impacts are increased household and community conflicts as individuals compete for declining resources. This can lead to large-scale displacement, with further suffering and environmental damage which can result in forced migration (UNEP/OCHA 2014). Over the long term, further degradation or depletion of natural resources such as water, farmland, pastureland, wetlands and forests put vulnerable populations at risk.

Arguably, vulnerability plays a key role in conflicts. Perry et al. (2010) describe how women are particularly vulnerable and often disproportionately affected by environmental change and conflicts due to gendered power relations, especially in terms of control of and access to resources such as land. Thus, this cycle contributes to both an increase in poverty and vulnerability as well as environmental degradation. Jaggernath (2010) explores how economic growth and industrial development can lead to conflict, when poor and marginalized racial groups suffer the environmental and health consequences of development. The devastating effects of conflict cut across social, economic and environmental spheres. The most apparent are destruction of environment, loss of property, life and livelihoods and displacement. Psychological trauma, physical incapacitation, poverty and malnutrition amplify the human suffering and impacts of conflicts.

Conflict, migration and environmental stewardship

In emergency situations, especially where populations are trying to escape from war or conflict, environmental issues tend never to be top priority for individuals, households or humanitarian organizations.

Conflicts degrade environmental stewardship of the local communities. When they emerge and escalate to a civil war-type scenario, such as that in South Sudan, people prioritize survival, concentrating on saving their lives and those of their family members. This is their first priority, even if it involves exploiting resources in their surroundings or those adjacent to the localities where they are sheltered. Environmental issues become more salient after the lives of the people at risk have been secured. Additionally, in war-affected areas, law enforcement structures often become weak or non-existent, opening the door for persons to exploit the resources in any way that they can. National parks and protected areas suffered extensively in Rwanda during the war and upheavals in the 1990s. Conflict and war also destroy institutional capital and the empowerment, agency and options for people to carry out environmental activities under a proper governance structure. As a result, in war and conflict situations, natural resources tend to become virtually free-access, with those responsible for protecting them and implementing actions to boost environmental sustainability often missing.

Migration affects the environmental stewardship of refugees and local communities; lives are in flux and precarious, which reduces motivation to engage in environmental conservation. Most refugee conditions are temporary although protracted. Some refugees move back to their homeland while others relocate to another country that offers them residence. Some engage in environmental conservation efforts in the short term. Whatever the specific case, strong sensitization is required to help refugees and host communities appreciate the primacy of natural resource management.

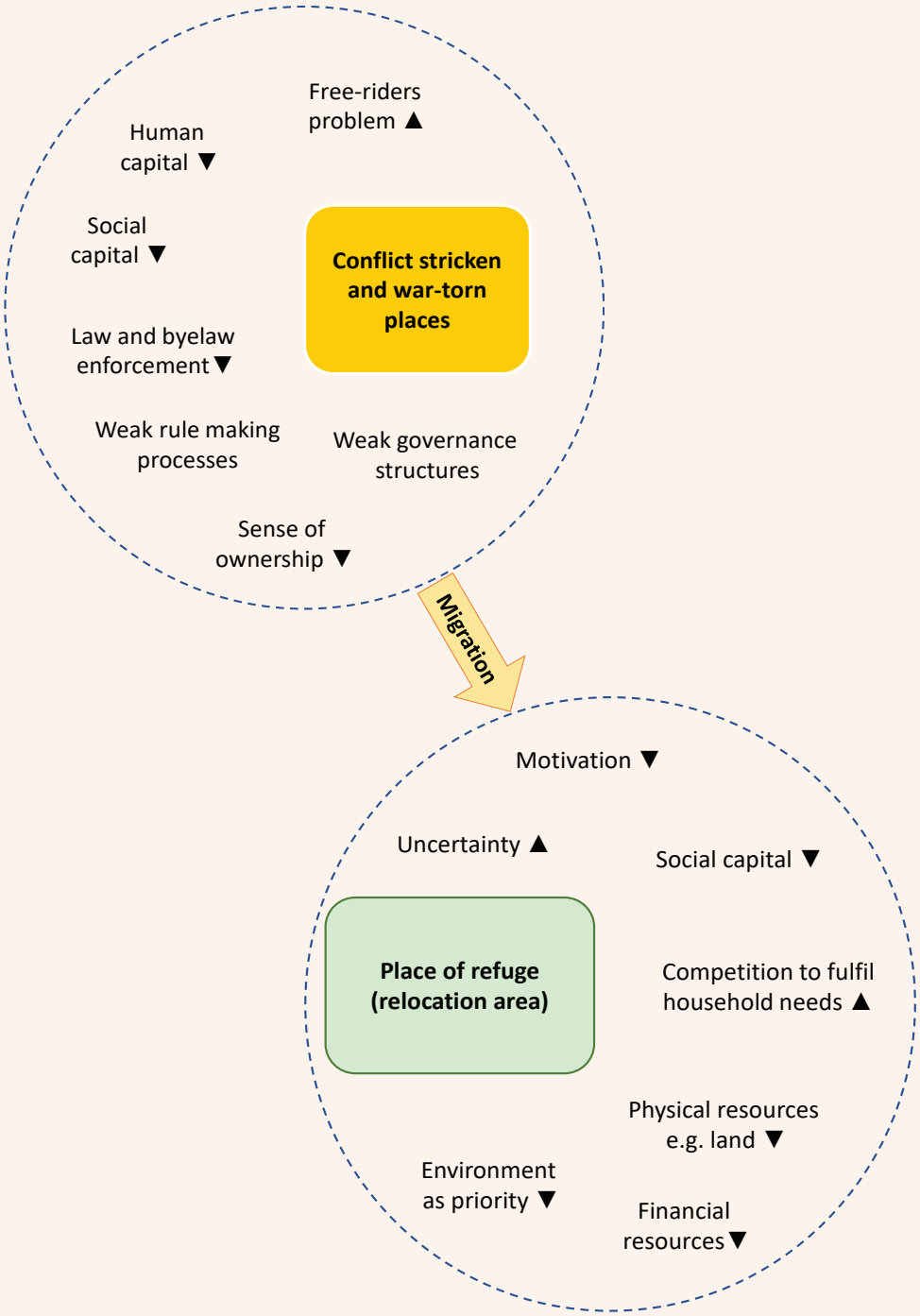


Figure 1 A schematic of the dual effects of conflict and war on environmental stewardship in conflict and refugee settlement areas. Note ▲ and ▼ show the direction of impact of the attribute represented as increase or decrease respectively

Conflict and war significantly affect the practitioners, the other key environmental stewards. Practitioners in conflict and war-affected areas struggle to maintain their operations to manage natural resources.

Conflict and war demolish or severely undermine the social and human capital that boosts environmental stewardship. Social capital is the first to suffer since populations are preoccupied with saving life. Furthermore, since populations disperse in different directions, socio-cultural networks weaken. In their new homes, where they resettle, they usually lack the luxury of choosing with whom to be a neighbor. Most refugee families are obliged to create new social bonds and a new social fabric before they think of collective action to promote environmental stewardship.

Conflict and war significantly affect the practitioners, the other key environmental stewards. Practitioners in conflict and war-affected areas struggle to maintain their operations to manage natural resources. This is largely due to lack of resources or supportive government schemes and the risk associated with the conflict and war to the lives of the practitioners and their families. Many practitioners migrate to a safer country, which creates a significant brain drain. With the out-migrating practitioners, their country loses skills and knowledge that could have advanced natural resource management. Non-individual practitioners such as government institutions also fail to accomplish their usual mandates of natural resource management due to poor coordination and support to the workforce that carries out natural resource management interventions.

Conflict and war significantly affect environmental stewardship on the part of donors as well. First, in conflict and war situations, attention first goes to saving lives and emergency response; investments in environmental activities receive minimal attention. Second, where there is war and conflict, accountability and transparency weaken, which poses significant risk for donors who would like to contribute to efforts to manage natural resources. Third, conflict and war lead to very weak monitoring capacity. This makes assessing the effectiveness of the investments almost impossible and discourages donors from investing in such contexts.

In summary, conflict reduces the environmental stewardship of local people, practitioners and donors and exposes natural resources to unsustainable and destructive exploitation due to weak rule of law and lack of law enforcement.

Uganda's progressive refugee resettlement approach

Uganda has a unique and unusually progressive strategy of welcoming refugees and asylum seekers. Two major policy instruments underlie this - The 2006 Refugees Act and the 2010 Refugees Regulations. These instruments grant protection and freedoms to refugees including property rights, freedom of movement, the right to work, and the provision of services. Refugees can integrate within host communities and have access to the same public services as citizens as well as freedom of movement and freedom to pursue livelihood opportunities, including accessing the labour market and establishing businesses.

Based on these instruments, the country has created open borders for any refugee or asylum seeker irrespective of his or her nationality. Uganda has been lauded for these generous refugee laws and policy regime (UNDP 2017), the first of their kind in Africa and the world. Some sources attribute these policy instruments to Uganda's own history; the country experienced multiple conflicts, and considerable numbers of its own population have been internally or externally displaced at various times. In the 1980s, most adults today in NW Uganda were refugees in what was then Sudan and Zaire; other parts of the country experienced internal displacement due to war, cattle raids or rebellion. As a result, many Ugandan communities understand what it means to be a refugee or a displaced person, and feel the pain suffered by those who come into Uganda as refugees. This goes some way to explain why some districts accept refugees with little, if any, challenge.

However, if the situations in South Sudan and DR Congo fail to improve, refugees will continue to flow into Uganda, straining its open-border model. With already difficult conditions where the refugees are being resettled currently, the carrying capacity of landscapes may soon be reached and resource degradation will intensify. In addition, with multiple demands on global aid, the capacity and reach of humanitarian agencies may be compromised. Left with no option, refugees may then resort to exploiting the remaining resources further, creating even graver environmental and livelihood risks.

Large-scale human migration from South Sudan to Northern Uganda: the trends

The conflict in South Sudan has become the largest and most complex emergency in Africa. As the political situation deteriorates, close to four million people, one-third of the total population, are displaced. More than 2.4 million South Sudanese have fled the country and an estimated 7.5 million need urgent humanitarian assistance inside South Sudan, including more than 1.5 million internally displaced people (IDPs). Recent and continuing violence has generated new displacement, particularly in the Eastern Equatorial region and Western Bahr el Ghazal (UNHCR 2017, OPM 2016).

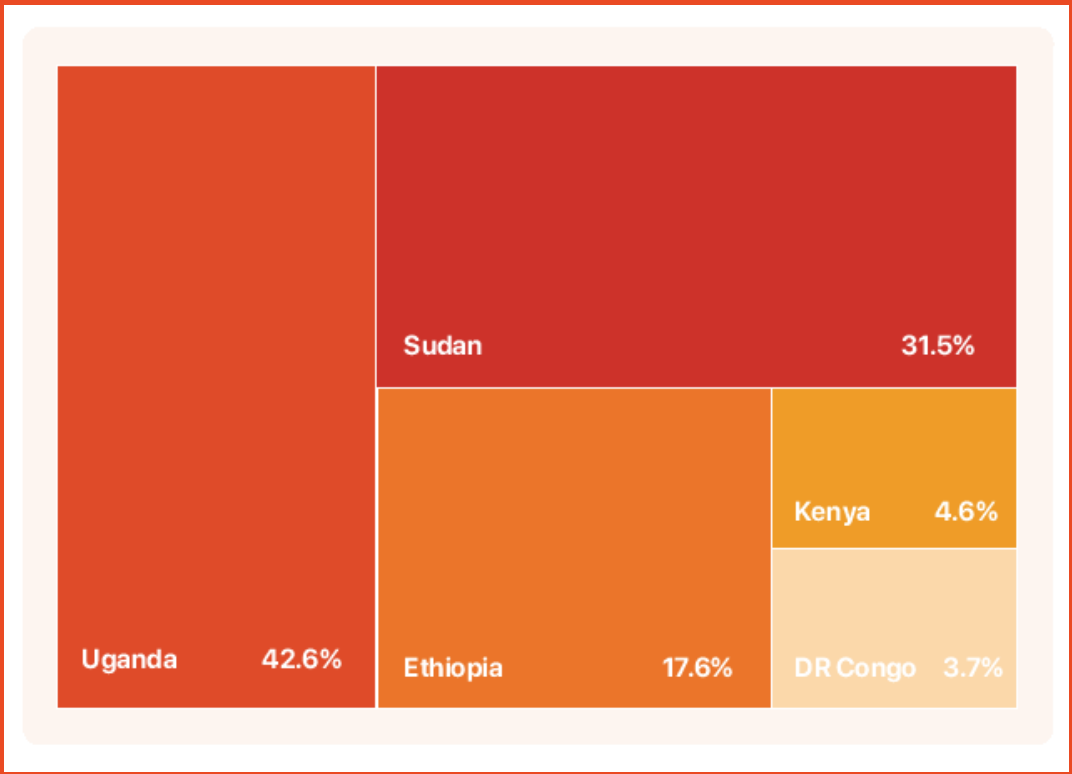


Figure 2 The distribution of South Sudanese refugees across countries in Eastern Africa

Out of all South Sudanese refugees, 42.6%, currently reside in Uganda (Figure 2). By the end of December 2017, Uganda had hosted an estimated 1,037,898. Some 195,000 South Sudanese arrived in the first three months of 2017 alone, an average rate of 2,000 refugees each day, most originating from farming communities in the productive Equatorial region (World Vision 2017; UNHCR 2018).

Currently, the total number of refugees in Uganda is being assessed biometrically. Whatever the results, the country hosts one of the world's largest refugee populations. (UNHCR 2017, 2018). It maintains open borders and promotes self-reliance of refugees and peaceful co-existence with host communities. Today, the important belt of moist wooded savannah where most South Sudanese refugees reside is under pressure.

Refugee distribution in Uganda

Uganda has hosted refugees and asylum seekers since the 1950s due to conflicts in nearby countries (OPM 2016 & 2017, UNDP 2017). In 2017, the country hosted a total of 1,395,146 refugees and asylum seekers from South Sudan, DR Congo, Burundi, Somalia and other countries (OPM 2017; UNICEF 2018, UNHCR 2018). Uganda is the largest refugee hosting country in Africa, and the third largest globally (GoU and UNHCR, 2017).The country has multiple entry points along the South Sudan border.

The typical journey of an individual seeking refuge is made up of entry, settlement and integration. During the entry phase, refugees spend one to three days at a reception centre, where they undergo health screening and registration of all household members, and are provided with nonfood items. A fact sheet for each refugee is generated and used by the Refugee Eligibility Council (REC) to grant or deny refugee status. During the settlement phase, land for residential and agricultural use is allocated. During the integration phase, refugees access services, including education, health care, water, security and protection and agricultural extension (UNDP 2017).

Refugees are currently hosted in 30 refugee settlements in 11 districts. Five of these districts are in the north of Uganda, and four out of these five, are in the region of West Nile in the country's northwest. Those four districts – Yumbe, Arua, Adjumani and Moyo – host the clear majority of South Sudanese refugees in Uganda, a total of 944,559, which in itself constitutes over 90% of all refugees in Uganda at present(figure 3). Some refugees opt to live in urban areas, including the 8% who live in Kampala, the capital city.

Of the refugees now in Uganda, 61% are children and a little less than 2% are over 60 years.

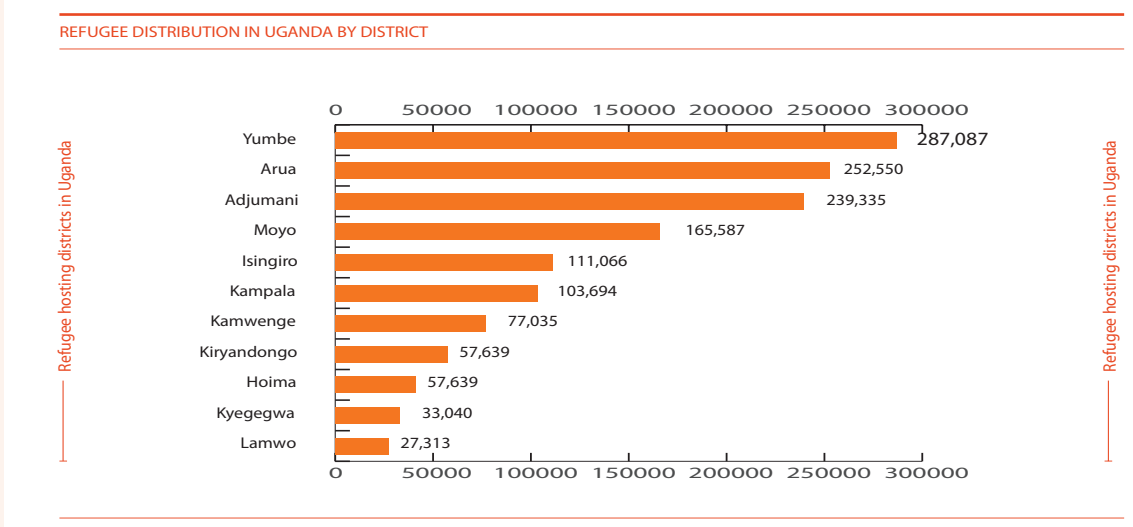


Figure 3 Refugee distribution in Uganda by districts. Note: These figures are as of late 2017

Arua district: the second largest refugee-hosting district

Arua district lies between latitude 2030'N and 30 50'N and longitude 300 30'E and 310 30'E in NW Uganda. Arua town, the administrative and commercial headquarters, is 520 km from Kampala. The district covers 4274 sq.km, 87% of which is arable. The district has a bi-modal rainfall pattern with rains in April to May and August to October. The wettest months are normally August and September, receiving an average rainfall of 120mm/ month. The average annual total rainfall is 1250mm. The mean monthly evaporation ranges from 130 to 180mm. In the dry season (December-March), temperatures are high.

The district lacks adequate surface and ground water resources. The Nile is a very reliable water source and has attracted significant settlement along it. However, it is not strategically located and less than 0.2% of the district's total area directly benefits from it, almost all within Madi-Okollo County. The Albert Nile is fed by streams and ground water during the heavy rains and loses water during the dry season through evaporation and to the surrounding unconsolidated sands, silt and gravel that recharge the water content of the countryside through natural means. River Enyau is the major river fed by River Nara and draining to the East. Close to 27% of the population in Arua district use borehole water. Wetlands cover approximately 3% (215 km^2) of the district land area; they allow water to stay in one place long enough to infiltrate and thus increase access to water for plants. Extensive wetland encroachment for crop cultivation, however, is directly affecting ground water recharge and threatening the biodiversity that depends on the wetlands.

As of 2014, the district had an estimated population of 782,077 living in 146,627 households (Uganda Bureau of Statistics 2017); 26% of these households are female-headed. The male to female ratio of the population is about 0.92. As of 31 December 2017, about 24% of the district population were refugees. South Sudanese refugees are of diverse ethnic backgrounds, including Dinkas, Kuku, Nuer, Kakwa, Madi and Siluk. Many of these groups are culturally and linguistically close to the peoples of Arua district, who are largely Lugbara with some Madi communities. The Kakwa and Alur people live in districts adjacent to Arua. Generally, the refugee and host communities enjoy a cordial relationship, which creates a favorable environment for business. There have been incidents, however, between the host communities and the refugees in areas where scarcity of natural resources is worsening (UIA 2017).

ANNUAL RAINFALL FROM 1998 to 2012 IN ARUA DISTRICT

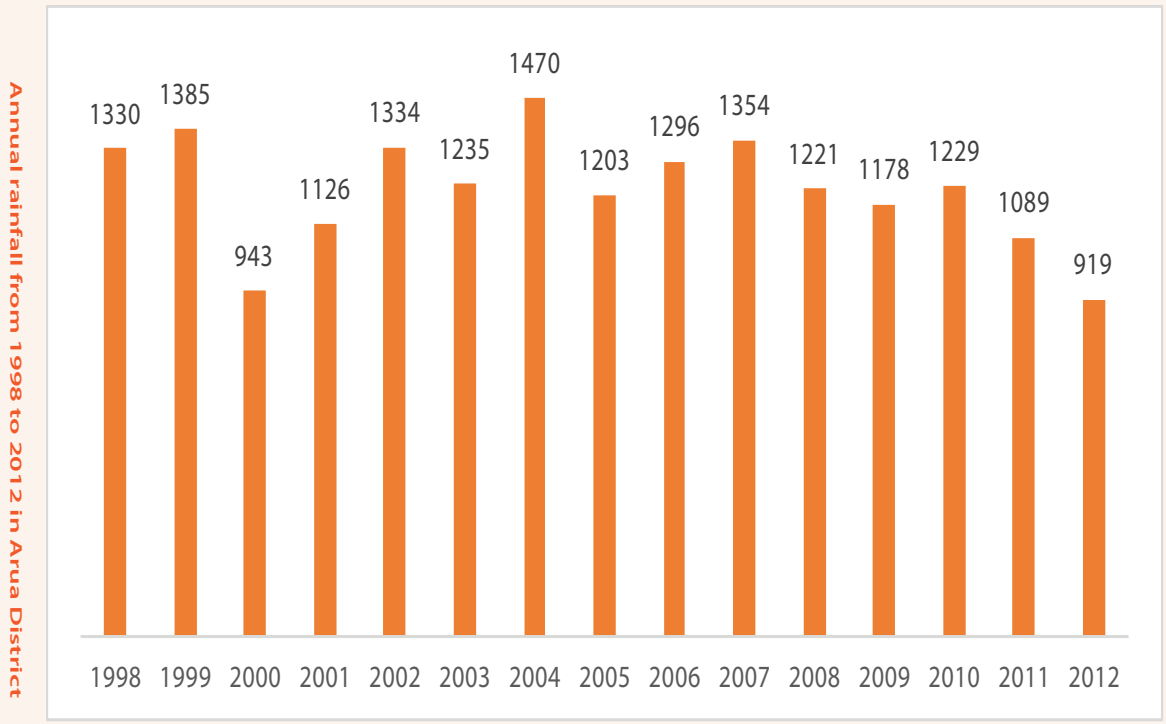


Figure 4 Annual rainfall from 1998 to 2012 in Arua District

MONTHLY RAINFALL DISTRIBUTION IN ARUA DISTRICT

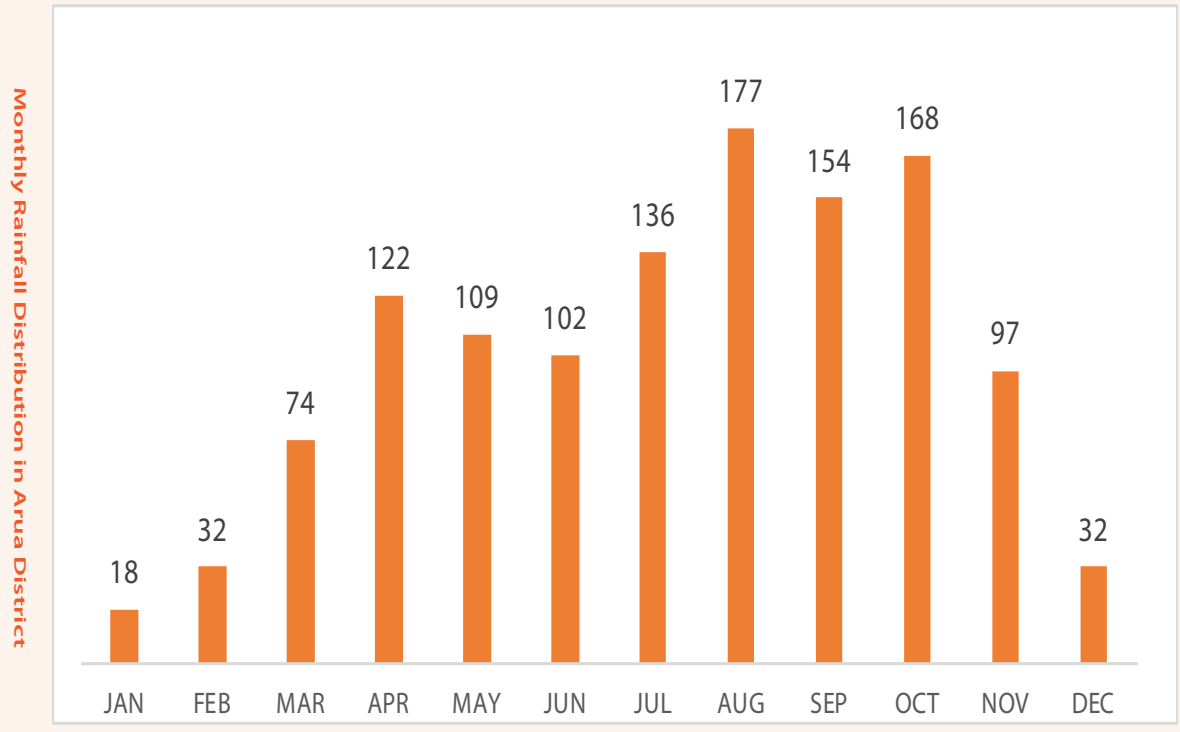
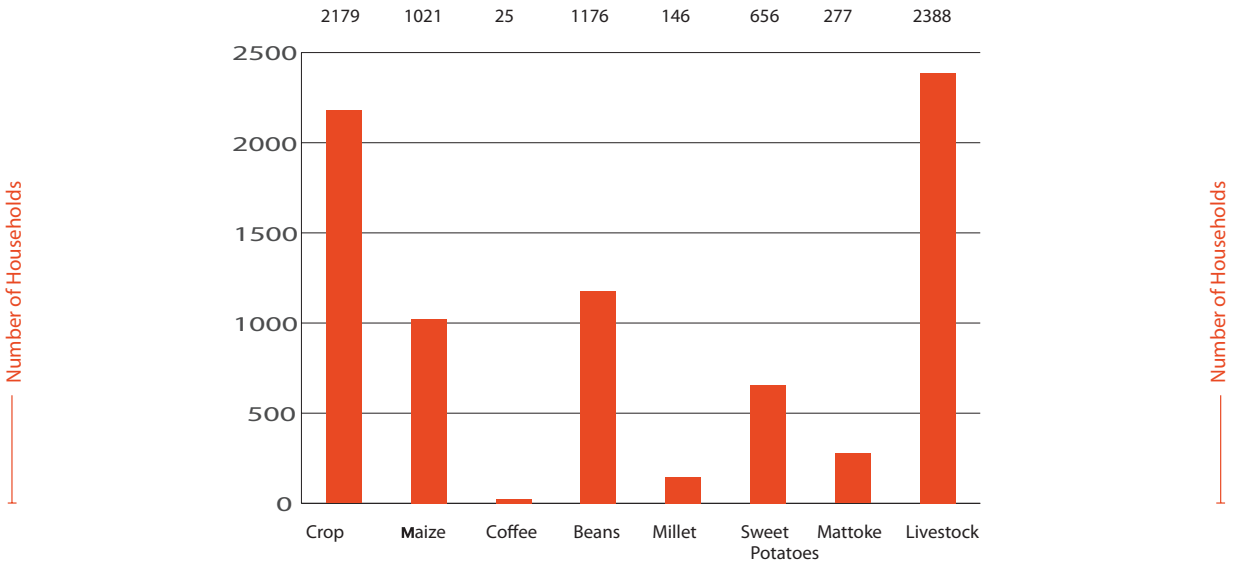


Figure 5 Monthly Rainfall Distribution in Arua District

TYPES OF FARMING PRACTICES



* Figure 6 Types of agricultural activities practiced in Arua district (UBS 2017)

Rhino Camp refugee settlement covers 85.525km^2 while Imvepi refugee settlement covers 52.937km^2

The Rhino Camp and Imvepi refugee settlements are located in Arua. The Rhino Camp refugee settlement has a total area of 85.525km^2 of which more than half was already occupied by refugees as at January 2017. The unoccupied area at that time was around 38.312km^2 of which 65% was designated for farming, 23% for residential and 12% for infrastructural developments.

Imvepi refugee settlement has a total area of 52.937km^2, 88% of which is designated for settlement and agricultural use while the remainder is left for roads and the development of facilities. As per the plans prepared by the OPM and UNHCR, this settlement which had the capacity to host 8,200 individuals is already almost full.

Arua's economy is driven by agriculture. According to UBOS (2017), 78% of households depend on subsistence farming as a main source of livelihood; 87% are engaged in crop growing, 0.6% in animal rearing, and 0.9% in fishing. Crop farming is rain-fed and therefore influenced by climate. Major food crops include cassava, beans, groundnuts, sesame, millet and maize. Tobacco is the major cash crop. Honey production and trade is a known income-generating activity (UIA 2017). Charcoal has emerged as a source of livelihood in recent years; the district has attempted to enforce a ban on large-scale production destined for Kampala. Below are refugee homes surrounded by fields of sesame in October 2018. (Photo Credit: ICRAF/Cathy Watson)

Environmental issues in humanitarian settings: unpacking the reality in Rhino Camp and Imvepi refugee settlements

In a humanitarian crisis, efforts to address environmental management and sustainability may seem at odds with saving lives. As Kelly (2004) puts it: "The midst of a humanitarian crisis may not look like the best time to start trying to hug trees." Still, failing to consider the environment when providing relief aid can lead to a flawed understanding of an emerging crisis and produce relief efforts that lead to environmental damage. Cases of environmental damage arising from humanitarian assistance are not well captured in the official literature, in part because they reflect poorly on those who provided assistance which limits lessons learned. For instance, in Rwandan refugee camps in Tanzania, unmilled maize provided as food aid was found to take longer to cook, which led to more tree cutting than milled maize. Despite this lesson, unmilled maize was provided to the displaced in Darfur, Sudan, even though women there faced considerable personal danger collecting firewood. Such risks to women are common and were documented by Kumssa et al. (2014) in Dadaab refugee camp in Kenya as well.

The situation in Arua is an illustrative case of land use change and loss of vegetative cover upon the arrival of refugees. When a refugee community settles, they need to build residential accommodation, cook food, access water for drinking and washing, and obtain wood to make their farm implements and household utensils. These urgencies put intense pressure on the natural environment. Refugees that were settled in Imvepi and Rhino Camp only received a plastic tarpaulin from UNHCR for shelter. They soon began building houses from wood. Since the refugee settlements are located in a mix of open and closed woodland (environments with extensive but finite woody biomass), the extraction of wood for construction led to complete clearance of the woodlands in some areas. As far back as 1995, Hoerz suggested that poles and beams for building houses should be part of the emergency response action.

Teak was planted during a previous refugee influx in 1998. Twenty years later the woodlot was felled by refugees who needed building materials for their homes in Rhino Camp refugee settlement (Photo Credit: ICRAF/ Lalisa Duguma)

The need for fuelwood creates intense pressure on woody biomass, and there is a significant shortage of fuelwood. The extent of depletion of surrounding woodlands is severe. Some refugees report resorting to an in-kind market where they exchange their rations of beans and maize for firewood with the host community. Reports of women and girls traveling long distances to collect firewood are common. Vital to address this crisis is promoting alternative energy sources for cooking (UNHCR 2016), such as farmer-managed natural regeneration (FMNR), afforestation and reforestation with fast-growing trees, and improved stoves (World Vision 2017). Measurements of fuel consumption in the nearby Bidi Bidi settlement suggest that the per capita air-dried fuelwood consumption is 3.5kg. To date, efforts to address energy have largely focused on use of improved cook-stoves with better energy efficiency (FAO and UNHCR 2017) rather than the creation of a greater supply of wood itself through planting or regeneration.

Harvesting of wood from woodlands to make household furniture is also a frequent activity in settlements. Arriving without beds, tables or chairs, every family needs furniture and either makes it for themselves or buys it from refugees who make it. There is a market for wooden household furniture, which has also escalated depletion of the surrounding woodlands.

Left and centre: Household furniture in Imvepi refugee settlement made from natural resources, largely branches, stems or trunks of woodland tree and shrub species. The chair and bed slats are made from the ribs of the leaves of Borassus palms (Photo Credit: ICRAF/ Lalisa Duguma)

Right: Sarai Akujo, a refugee, makes winnowing baskets from palm leaves to sell (Photo Credit: ICRAF/Cathy Watson)

Water

Water is a further key resource that has been exploited extensively since the arrival of the refugees. UNHCR and other humanitarian organizations such as the Danish and Norwegian Refugee Councils provided water for daily consumption.

Water is a further key resource that has been exploited extensively since the arrival of the refugees. UNHCR and other humanitarian organizations such as the Danish and Norwegian Refugee Councils provided water for daily consumption. The water was trucked from the surrounding water bodies or pumped from boreholes. Water sources are over-exploited, and concern has been growing that this is unsustainable. Some effort was made to manage watersheds and the surrounding vegetation, both of which play key roles in ensuring rainwater infiltration and ground water recharge.

According to UNHCR WASH data, 692 boreholes are currently operational and active in Arua, 56 of which are located in Rhino Camp and Imvepi settlements. Once the shortage intensifies, people might revert to extracting water from the Nile river located about an hour away from the refugee settlements. Lack of integrated planning of borehole water extraction is evident and can severely affect the available water resources, not only in the settlements, but in the entire region. This, and the unsustainable costly trucking of water, threaten the ability of humanitarian organizations and the OPM to support refugees in the long run, especially if repatriation does not occur for many years.

In summary, it is impossible to say that people should not cut trees, cook their food, build their house or make household furniture. Similarly, it is difficult to condemn the current exploitation of water as refugees cannot survive without it. However, interventions can be designed to ensure that resources are sustainably managed and utilized. Promising approaches include more efficient resource utilization, engaging communities in rehabilitation and regeneration, and introducing technologies, such as solar energy, that could reduce the need for wood as a key source of household needs. Implementing such options requires incentives since refugees lack financial capacity and access to resources.

Further, while in an emergency the priority is saving lives, with appropriate preparedness, it is possible to also promote sustainable use and management of natural resources. Failing to do this will create more challenges for the host and refugee communities, and survival will become more difficult in an area that is already constrained due to existing biophysical and climatic conditions. Environmental considerations need to be systematically integrated into humanitarian programmes and operations.

Water Trucking

Key actors in environment and related issues in humanitarian settings in Uganda

There are about 44 active organizations, mainly comprising NGOs. Table 1 provides names and some insight into their roles.

Table 1 Actors involved in the humanitarian sector in Uganda

* KEY ACTORS		
Category of actor	Name of actor	Sector
Government agencies	OPM (Office of the Prime Minister)	Overall humanitarian work coordination
	Ministry of Energy and Mineral Development	Energy
	Ministry of Water and Environment	Water; Environment
	Ministry of Education and Sports	Education
	District Forestry offices	Environment
	Uganda Refugee and Disaster Management Council	Humanitarian
UN organizations	UNHCR	Overall humanitarian coordination
	World Food Programme	Food; Nutrition
	UN FAO	Livelihoods; Environment
	UN Women	Women and girls; Gender equality
	UNICEF	Child protection; Emergency response; Disaster response
	United Nations Population Fund	Empowerment; Population health
Non-Governmental Organizations	Norwegian Refugee Council	Water; Environment
	Danish Refugee Council	Water; Environment
	GIZ	Water; Environment
	ICRAF	Environment; Agroforestry
	African Refugee Development Center	Water; Environment
	Action Africa Help International	Agriculture; Environment; Energy; Humanitarian support
	Action international contre la faim	Safe water; Hunger eradication
	African Refugee Committee	Humanitarian support
	African Initiatives for Relief and Development	General humanitarian support
	World Vision	Humanitarian; Energy; Livelihoods; Small and Medium Businesses
	Community Empowerment for Rural Development- Hivos	Sustainable food; Energy; Empowerment
	Caritas	Livelihoods; Environment; Peace building
	Agency for Cooperation and Research in Development	Livelihoods; Governance; Gender
	Concern Worldwide	Emergency; Livelihood; Income; Water, hygiene and sanitation
	Finnish Refugee Council	Education

Key actors

* KEY ACTORS		
Category of actors	Name of actor	Sectoral engagement
Non-Governmental Organizations	HelpAge International	Humanitarian; Climate Change; The elderly; Social protection
	Interaid Uganda	Environment; Water, hygiene and sanitation; Livelihood; Food security
	International Aid Services	Integrated water resource management; Inclusive education
	International Federation of Red Cross and Red Crescent Societies	Capacity building; Emergency management; Community engagement
	International Rescue Committee	Community engagement and accountability; Emergency relief
	Lutheran World Federation	Humanitarian; Environment
	Malteser International	Emergency medical services; Water and sanitation
	Medical Teams International	Medical services
	Oxfam	Resilient livelihoods; Accountability; Humanitarian
	Plan International	Water and Sanitation; Education; Economic empowerment
	Real Medicine Foundation	Health care; Education; Humanitarian response
	Samaritan's Purse – International Relief	Agriculture; Livelihoods; Water, hygiene and sanitation; Spiritual issues
	Save the Children International	Humanitarian response; Poverty alleviation; Humanitarian response; Governance
	Touch Africa	Poverty reduction; Environmental conservation; Social justice
	Transcultural Psychosocial Organization	Emergency response; Child protection; Food security
	Trauma Counselling	Counselling
	War Child	Child protection and livelihoods
	Water Mission International	Water; Community development
	Xavier Project	Education; Livelihoods
	Windle Trust	Education; Youth
	Zoa	Food security; Livelihoods; Water, Sanitation and hygiene

* Source: UNHCR database (accessed 13 March 2018) Note that this represents only a selected list of actors.

Lessons from other human-environment interfaces within humanitarian settings: brief case studies

The following demonstrate that it is impossible to ignore the consequences of migration for the environment and that strategic rethinking is needed on how humanitarian actions could incorporate environmental management at individual and institutional level.

Abu Shouk IDP camp, Sudan

- Depletion of groundwater by over-extraction which can lead to salt intrusion or a reduction of yield in previously existing wells and boreholes. In 2006, in the Abu Shouk IDP camp in North Darfur, five of 12 boreholes ran dry from over-extraction, indicating a substantial drop in the water table as the groundwater reserves could no longer match the 1,000 m^3 extracted each day (Tearfund 2007);
- Pollution of ground water reservoirs and/or surface water bodies;
- Rangeland degradation because of increased livestock numbers that often exceed a region's carrying capacity.

Refugee camps, Somalia

- Uncontrolled use of natural resources as a direct means of income generation and livelihood support, for example, charcoal-making in Somalia where native woodland is now disappearing at an alarming rate (IRIN 2009);
- Excessive and/or inappropriate use or disposal of chemicals such as those used for vector control or in water treatment.

Dadaab Refugee Camp, Kenya

- Extensive depletion of woodland resources was reported in the area due to extraction of firewood and construction materials (Kumssa et al 2014; Abdi 2005). GIZ introduced innovative energy projects which lessened the reliance of refugees on woodlands for energy, hence reducing exposure women and girls to gender violence. Through this effort, GIZ introduced the Maendeleo Portable Stove which has a fuel efficiency of about 45-50% compared to the average 9% fuel efficiency from three-stone systems (Duguma et al 2014). This reduces firewood demands by a factor of at least four.

Embedding environmental issues in humanitarian emergency response settings: A proposition for future action to reduce degradation

Undoubtedly, saving lives is always the top priority in the context of people fleeing war-torn countries such as South Sudan, and humanitarian efforts rightly make that their aim. However, to date, the limited attention paid by humanitarian efforts to environmental issues is counterproductive, jeopardizing both ongoing operations and possibly laying the ground for further conflict and migration. The cycle is a vicious one that never ends. Resource degradation could trigger conflict, resulting in human migration which has a negative impact on environmental stewardship. Lack of environmental stewardship could, on its own, trigger conflict since people may begin to fight over the remaining resources. This can then propel some (often the less capable and less privileged groups) to migrate. In instances of large scale migration, this then triggers another environmental concern since in most cases such migrating masses rely on local resources where they settle.

To ascertain how environmental issues are valued, taken into account, recognized and figure as priorities in humanitarian responses, we looked at the relative share of natural resource management, water and energy services in UNHCR's budget in Uganda 2014-2017. This UN body is the global coordinator of humanitarian response to refugees and budget expenditure or allocation is a proxy for priority because operations depend on resources and priority operations receive higher allocations.

- We observe that over the last five years, natural resource management (NRM) never received more than 2% of the budget, although it did increase seven-fold between 2014 and 2017.
- The low proportion spent on energy, on average under 1% a year, is due to most refugees having access to effectively free wood harvested from the landscape. The actual cost of energy is not accounted for, but could amount to millions of dollars. Using a refugee figure of 1,395,146 and an average per capita per day consumption of 3.5kg firewood (FAO and UNHCR 2017), Uganda needs to produce close to 1.78 billion kg of dry firewood every year. The woodlands of Uganda are catering for this at almost no cost. Using an average price of UGX 4,000 per bundle weighing about 20kg, the value of firewood provided by woodlands to the refugees is about USD 96.56 million per year at an exchange rate of UGX 3,691.64 per USD. This translates to USD 69 per capita per year. Note that this does not include charcoal.
- Water, largely trucked in, had the highest cost, reaching almost 9% of the budget in 2018.

Our conclusion is that investment in natural resource management is still not where it merits to be and far more is needed; the true cost of energy is masked by these figures and includes the cost of environmental degradation.

Addressing environmental issues calls for a marked change in how humanitarian responses are planned and executed, especially where poverty is prevalent. Humanitarian responses require concrete strategies and actions to address the environmental concerns and challenges that accompany migration and displacement. These include:

1. Create a unit that responds to environmental issues from the start of emergency situations. The role of such team or unit within humanitarian organizations should be to assess the impact and implications of the emergency on the environment.
2. Develop comprehensive guidelines that are enshrined in the humanitarian response. These should be easy to implement at any scale, but particularly at district and village level through environmental committees.
3. Revise UNHCR's Environmental Guidelines, which were developed in the 1990s, and incorporate concepts such as climate change, resilience, ecosystem services and biodiversity. Ensure buy-in and implementation.
4. In areas where resettlement must occur, conduct proper environmental impact assessments to reduce possible externalities emerging from the crisis.
5. Design and implement awareness-creation interventions to help refugee and host communities understand the importance of environmental conservation for their well-being and indeed, survival.
6. Support the refugee and host communities to engage in environmental conservation.
7. Create an effective partnership model which brings on board institutions that work alongside those conducting humanitarian responses.
8. Devise response strategies or actions to offset the negative externalities of resettling refugees in a given location. This could involve:
    a. Strategies to rehabilitate the environment that is degraded due to pressure created by the influx.
    b. Create innovative resource utilization schemes which reduce extensive reliance on local resources that might take longer to rehabilitate. This may involve water-efficient irrigation schemes, use of solar energy for lighting, and use of non-wood materials for construction.
    c. Allocate communal pieces of lands, if land is abundant, where refugees can conserve and also grow their own sources of wood through planting and regeneration.

From left to right: A member of the host community carries a load of fuel wood. A worker in the ICRAF nursery which employed 60 members of the two communities during the peak season in 2018. The nursery supplied 150,000 seedlings to refugee and host families. An ICRAF community facilitator checks a papaya tree planted just four months earlier on a refugee plot (Photo Credit: ICRAF/Cathy Watson)

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A handful of the *Balanites aegyptiaca* fruit. This is an important tree in the drylands of NW Uganda and South Sudan. Its young leaves and tender shoots can be used as a vegetable, while the kernels can produce edible oil used for cooking (Photo Credit: ICRAF/Cathy Watson)

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