Refugees, host communities and the environment:

A study on the impact of settling refugees in refugee hosting areas in Uganda

1. Introduction

With Africa hosting over 30% of the world's displaced people, Uganda stands out as the top refugee hosting country both in Africa and the third globally *(UNHCR statistics, June 2017).* Uganda has one of the most open-door refugee policies in the world offering opportunities aiming at the resettlement of the refugees. The country's 2006 Refugee Act has been recognised as exemplary given that it maintains open borders and promotes self-reliance of refugees and peaceful co-existence with host communities. The policy establishes refugees' rights to live, work, and start businesses in towns and cities. The country also gains because the refugees contribute to the Gross National Product and bring infrastructure to remote areas.

However resettling these refugees has had silent and enormous pressure on resources resulting into destruction of the environment as these refugees try to strive for means of surviving. Living conditions within the settlements are often characterized by limited resources resulting into heavy reliance on the environment. Refugee movements tend to produce uncontrolled modifications for example trees are being cut down to create space for shelter, farmland and wood fuel at the rate at which the environment cannot replenish causing the ``refugees, often women and children, to search increasingly further away putting them at increased risk of violent attack.. In addition, land degradation, unsustainable groundwater extraction, water pollution and human waste disposal by displaced persons contaminate local groundwater and cause the spread of diseases. Nonetheless, degrading the environment also has an impact on these refugees including struggle, growing conflict among different groups and communities.

The country continues to also receive refugees from the Democratic Republic of the Congo and Burundi with the current influx majorly from South Sudan since the South Sudan crisis erupted in December 2013. The majority of South Sudanese refugees have sought safety in Uganda and the country is struggling to cope with the ever-increasing needs with close to 86% of the south Sudanese refugees being women and children *(UNHCR statistics, June 2017).* Host communities and humanitarian agencies are struggling to feed and shelter the continuous refugee arrivals and provide basic services especially in Northern Uganda. There is already some evidence of an effect on the environment as a result of the need to meet these basic needs.

The total number of refugees in all the settlements by the end of December 2017 is estimated to be at 1,497,126 million people; with a stipulated expenditure of US$ 960.17 million budget to support the refugees in the region for the period of January to December 2017. *(UNHCR Uganda comprehensive refugee plan, 2017)*. This presents an urgent and massive need to respond to the critical situation.

According to Uganda contribution to refugee protection and management report by UNDP, 2017, the estimated expenditure amount in ecosystem loss was estimated to be at USD 90,682,169 and the costs for energy and water being estimated at USD 145,881,761. These two categories had a percentage contribution of 28% and 45% respectively to the entire refugee budget.

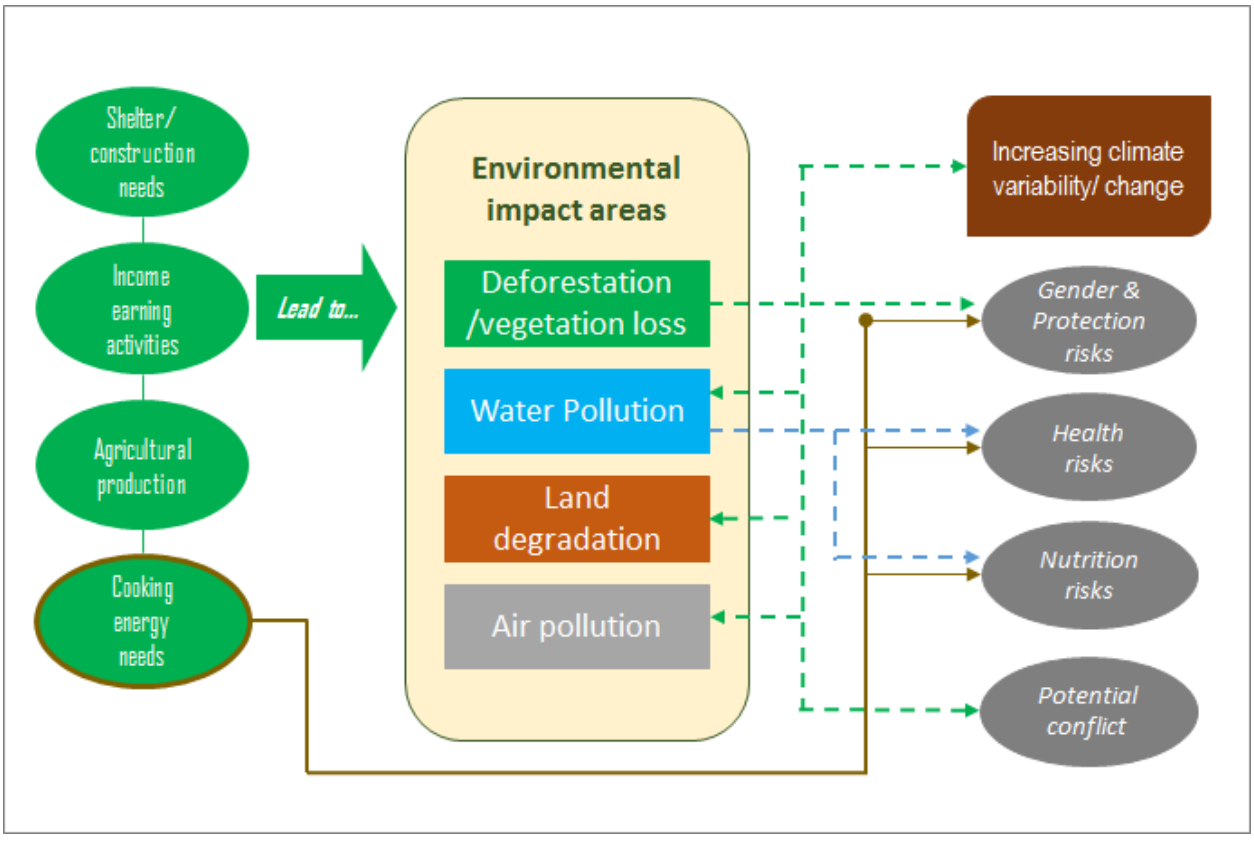
With the above scenario, it is important to establish and validate the effect of the settlement of refugees on the environment and clearly present the urgent need for interventions to motivate or influence additional funding for refugee support and sustainable livelihoods.

Conceptual framework

The settlement of refugees in the country is envisaged to impact on the environment in four broad ways owing to various livelihood and other activities as shown in **Figure 1**:

- Deforestation and general loss of vegetation cover;
- Water pollution and depletion of ground water resources;
- Land degradation and;
- Air pollution

As illustrated in Figure 1, the immediate needs of refugees arriving in the country will typically include shelter, cooking, agricultural production, and income generation. Meeting these needs necessarily impacts on the environment as household cut down trees to get firewood, construction poles; clear vegetation for agriculture, roofing materials; etc.



While it is recognized that all impact areas are important for environmental sustainability, this study will focus on deforestation and vegetation loss that is more closely linked to the livelihoods of refugees and host communities.

Besides contributing to water pollution, land degradation etc. deforestation/vegetation loss affects the micro-climate in the environs of the refugee settlement leading to increasing climate variability and climate change.

As refugees struggle to meet some of their basic needs, including cooking energy needs & income generation, they are faced with various risks:

- Gender & Protection risks – as they go out to look for firewood for cooking and sales;
- Health risks – associated with prolonged use of non-smoke free cooking energy
- Nutrition risks – as households, faced with declining availability of firewood, may be forced to undercook their food
- Potential conflicts with host communities – as refugees continuously deplete forest resources that should benefit both refugee and host communities.

Continued deforestation reinforces a vicious cycle in which households are faced with more difficulty in meeting the aforementioned basic needs and are exposed to more risks in trying to meet these needs.

2. Purpose of the study

The purpose of the study is two-fold: i) assess the extent to which the settlement of the refugees has affected the environment (forests & vegetation) in Uganda and ii) prospectively examine mitigating measures

3. Specific objectives

The following are the main objectives of the study:

1) To assess the impact of settling refugees on the environment with emphasis on forests and vegetation cover in the surrounding;
2) To assess the impact of environmental changes on the livelihoods and well-being of refugees and host communities (men, women & children);
3) To prospectively examine existing and potential mitigation measures against the continued deforestation and vegetation loss.

4. Methodology

The study will use both qualitative and quantitative methods to collect relevant information. The quantitative component of the study will follow a cross-sectional design in which households will be selected through a 2-stage sampling procedure. In the first stage, villages/clusters will be selected basing on the probability proportional to size procedure. In the second stage, households will be selected using household lists available from OPM through systematic random sampling.

Sample size

Sample size will be representative at settlement level and will be determined using the following formula by Anderson et al. (2008) as follows;

$$n = N * \frac{x}{(X+N-1)} \quad \text{..... (1)}$$

Where,

$$X = \frac{Z2*p(1-p)}{M.E2}$$

M.E is the desired margin of error at 5%
z is the z-score i.e. 1.96 for a 95% confidence interval,
p is the prior judgment of the correct value of p, 0.5
n is the sample size (to be found)

A total of 4,884 households will be interviewed across the 13 refugee settlements and host communities

Settlement	Total number of refugees (As at 21 Aug 17)[1]	Sample size (Refugees)	Sample size (hosts)	Total
Adjumani	226,303	230	154	384
Bidibidi	284,927	230	154	384
Imvepi	10,291	214	143	357
Kiryandongo	56,789	228	153	381
Kyaka II	26,526	226	152	378
Kyangwali	48,543	226	152	378
Lobule	4,400	214	143	357
Nakivale	96,712	229	153	382
Oruchinga	5,787	214	143	357
Palabek	30,296	229	149	378
Palorinya	111,581	230	153	383
Rhino camp	215,062	230	154	384
Rwamwanja	64,772	228	153	381

[1] These figures are from the records of the Office of the Prime Minister (OPM)

The qualitative component of the study will employ different techniques/methods including:

Transect walks & observation; Key informant interviews; and Focus Group Discussions. Transect walks will be conducted in each settlement with an observation checklist with the view to get an impression of the utilization of forest resources and the extent of depletion. Key informants will be identified from both refugee and host communities basing on their knowledge of the community and length of stay in that area. Focus Groups will be semi structured and will be organized with the view to elicit information from different sub groups in the refugee and host communities (women, men, leaders etc.)

The quantitative component will comprise of the following activities;-

Objective measurements and the statistical, mathematical, or numerical analysis of data collected through questionnaires, and surveys.

- Surveys, interviews and questionnaires that collect numerical information or count data by using closed-ended questions
- Observing or recording well-defined events such as the number of times the refugees receive fuel wood for cooking, cooking times, etc.

Methodological approach by objective

Objective	**Research questions**	**Methods/techniques**
To assess the impact of settling refugees on the environment with emphasis on forests and vegetation cover in the surrounding;	What was the state of the environment (forests & vegetation) before establishment of the refugee settlements? What is the current state of the environment after the establishment of the refugee settlement? What are the factors responsible for this change? What are the refugee and host community perceptions on the reasons for this change? To what extent are environmentally destructive practices being applied to meet livelihood needs among refugees and host communities?	Desk review; satellite imagery; observations; KIIs; FGDs; Household questionnaire
To assess the impact of environmental changes on the livelihoods and well-being of refugees and host communities (men, women & children);	How has the observed environmental change affected the well-being and livelihoods of refugees and host communities? Who is most affected by the observed environmental changes? What are your current energy needs? What do you use to meet your cooking needs, Where do you get it from, Is it sufficient? How do you cope in times of insufficiency? Who collects the fuel wood? Do they face any threats when conducting this activity?	Household questionnaire; FGDs

	What kind of threats and challenges do you face?	
To prospectively examine existing and potential mitigation measures for the continued deforestation and vegetation loss.	What initiatives are currently being implemented by government and other stakeholders to address deforestation and its effects? What initiatives have worked well, what hasn't worked, and why? What are the refugee and host community perceptions on the solutions to this problem? Which technologies can be successfully adapted to the refugee and host community environments to curb deforestation and its effects?	Desk review, KIIs, FGDs, Household questionnaire, Donor group questionnaire

5. Main activities

The main activities of the study will be as follows:

5.1 Desk review on available data and studies related to the baseline situation of the environment resources before the influx of refugees; and also an understanding of the specific energy needs related to cooking and shelter as well as any other identified basic needs.

5.2 Proper scoping of the study elements in collaboration with office of prime minister and other partners following the desk review.

5.3 Design data collection materials to collate data from the field and relevant stakeholders as identified with the office of the prime minister and World Food Program (WFP)

5.4 Site visits and interviews to collect data and assess the current situation

5.5 Data analysis and review

5.6 Develop a report with assessment of the situation at hand and possible recommendations

6. Scope and coverage

The study will establish the effect of refugee settlement on the environment. This will be carried out in all the refugee settlements across Uganda. Some of these settlements in Northern Uganda include Bidibidi in Yumbe, Imvepi, Palorinya in Moyo, Rhino Camp and Imvepi in Arua refugee camps as well as refugee settlements in South Western Uganda i.e. Nakivale, Oruchinga in Isingiro district, Rwamwanja in Kamwenge district, Kyangwali in Hoima district, Kyaka 11 in Kyegeggwa district and the five other settlements in Adjumani district including Mungula, Boroli, Maaji, Pagirinya and Ayiilo. The study will be carried out within a period of five months.

7. Expected outputs

The expected outputs of this study are:

7.1 An informative report on the effect of settlement of refugees on the environment (in particular deforestation rates) that will be used for advocacy and resource mobilisation by government and relevant partners on sustainable interventions that address energy needs of refugees and host communities. It will encompass crucial information on what the host communities and refugees require to ensure environmental sustainability and reduced conflict for natural resources and also inform on what strategies to use going forward for sustainable livelihoods.

7.2 Study findings to influence interventions by policy makers and support partners and thus result in increased and faster response to refugee needs.

7.3 Recommendations on how to facilitate more sustainable livelihoods for the refugees.

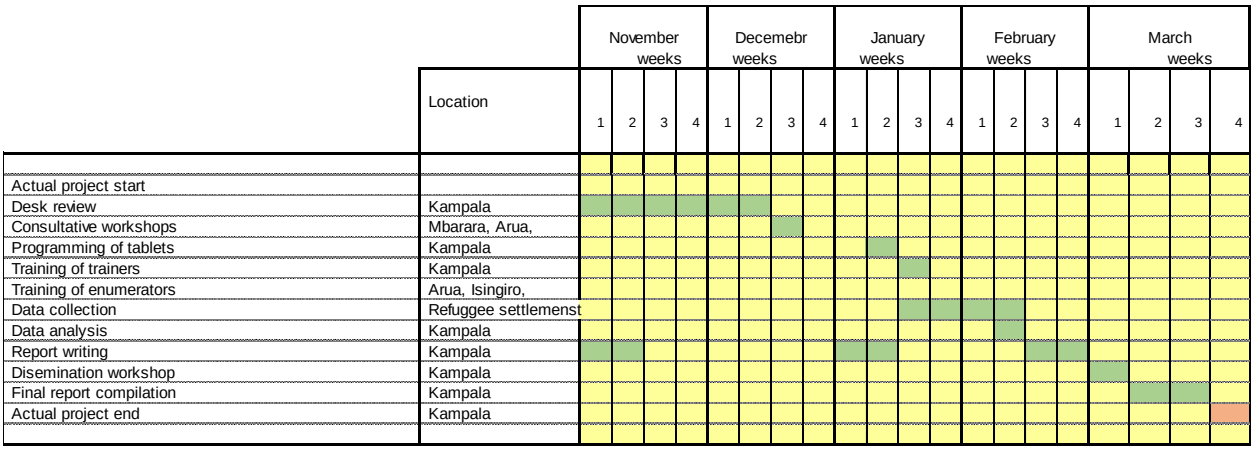
7.4 The assessment findings will determine which ones a project should focus on. Initial household and community assessments, as well as information collected from key stakeholders and secondary data sources, can be used as the benchmark against which the intended changes can be measured.

8. Budget

Item	Unit	Quantity	Frequency	Amount (USD)
Consultative workshop	Men	22	3	1,926
Training of trainers (Kampala)*	Men	13	13	1,032
Training of trainers (settlements)*	Men	13	13	633
Data collection (12 men)*	Days	5	1 settlement	2,025
Dissemination workshop	Men	65	1	5,490
Expenses				4,583
Professional fees	Men	9	1	49,900
Total				**65,589**

* These figures are based on the assumption of one settlement. They can be reduced or increase basing on the number of men involved and the number of settlements considered in the study.

9. Work plan



9. ANNEX

The Centre for Research in Energy and Energy Conservation

The Centre for Research in Energy and Energy Conservation (CREEC) is a non-profit organization for applied research, training and consultancy in renewable energy and energy conservation. The centre is located at the College of Engineering, Design, Art and Technology (CEDAT), Makerere University.

CREEC's mission is "to enhance access to modern types of energy through applied research, training and consultancy in East Africa". The project engineering arm of CREEC focuses on the thematic areas of: rural electrification, energy for productive use, household energy, energy entrepreneurship and energy efficiency. In addition, the testing and products development arm focuses on the areas of cookstoves, fuels and solar photovoltaic systems / equipment. The clients of CREEC are very diverse and these include national and local government, donor organisations, development agencies, NGOs, private sector and students.

CREEC offers services in testing (cook stoves and solar PV), project implementation, training, consultancy, awareness campaigns, applied research, feasibility studies, basic technical design, market surveys, baseline and impact studies, verifications and audits.

The centre aims at application and adaptation of technologies to the specific Ugandan and local environment with an emphasis on systems with components that can be locally manufactured. For capacity building and knowledge transfer purposes, CREEC endeavors to include students in the centre's projects whenever possible.

CREEC is experienced and is actively engaged in the following areas:

1.1 Solar PV

Solar PV activities / programs at CREEC are designed to promote and implement projects using solar PV power, both at household and institutional level. Below are some of the key accomplishments related to solar PV works at CREEC.

- CREEC has conducted a study on solar market development in Uganda for GIZ Uganda ENDEV. The first phase of this study was successfully completed in 2014 and the second phase was completed in 2016.
- A study on the challenges faced by private sector led investments in small scale renewable energy projects in Uganda was also successfully conducted by CREEC. This study involved interviews with a diverse category of players in the renewable energy sector in Uganda.
- With support from the President of Uganda's office through CEDAT under the umbrella of Presidential Initiative projects, CREEC boasts of a well-equipped solar PV laboratory. Various tests are done on solar PV products ranging from panels, through batteries to solar lamps. The laboratory is now recognized under the ISO/IEC 17025:2005 laboratory quality management system and is on the UNBS lab recognition / certification scheme;

making it an independent testing and certifying laboratory for the private sector that is importing, marketing and selling solar PV products. Testing is done in accordance with IEC standards.

- CREEC has developed a training program for solar technicians and students intending to roll out in solar PV especially those in rural areas. During such trainings, participants get hands on training in Solar PV with help from the well-equipped solar PV laboratory at the centre. Various technicians from the private sector have already been trained in design, installation and maintenance of solar PV systems.
- The centre has also installed a solar energy kiosk and mini-grid in Mukono and Kiboga districts respectively for improving access to modern types of energy and research purposes under the rural electrification project of Millennium Science Initiative (MSI) Programme. The kiosk rents out solar lamps to the community.
- CREEC successfully implemented a national awareness campaign called, Solar Lamps for Health and Wealth, under the Presidential Initiative among other projects under MSI and UNIDO. With support from UNIDO, the centre owns a solar powered business information centre and productive use units operated on renewable energy.

1.2 Bio energy

CREEC is currently active in four areas in bioenergy: improved cookstoves, biogas, gasification and briquette making. For this, CREEC has an independent Regional Testing and Knowledge Centre, RTKC, which is an internationally recognized stove and fuel laboratory working in partnership with the Global Alliance for Clean Cookstoves (GACC). The cookstove laboratory is also now recognized under the ISO/IEC 17025:2005 laboratory quality management system and is on the UNBS lab recognition / certification scheme. The objective of the RTKC is to provide stove and fuel testing services through globally accepted testing procedures for the East-African region; with a knowledge hub in bioenergy technologies, research, design and development. Other services provided under the RTKC include project implementation, awareness and sensitization, baseline and feasibility studies, capacity building and consultancies

Some of the key accomplishments related to cookstoves are:

- Successfully implemented a project sponsored by the World Bank on Biomass Energy Initiative for Africa. It involved training of tinsmiths to produce, sell and market TopLit UpDraft (TLUD) gasifier cookstoves covering both technical as entrepreneurial skills.
- The centre has been testing stoves since 2011 and has stove tests on over 100 different models of stoves from clients / manufacturers worldwide and test methods. Stove testing generates large volumes of data which are analysed statistically to make conclusive deductions.
- Field surveys to understand cook stove user behaviour and preferences. One key study conducted in Tanzania assessed performance of different stove types and their acceptability among users / households.

1.3 Pico-hydro

The main role of CREEC in pico-hydro power is training, consultancy and research. There have been a number of projects managed by CREEC under consultancy. These have been in collaboration with PSFU which has provided funding and they include: a 3kW pico-hydro scheme and a 92kW micro-hydro power scheme both in Kagando, Kasese district, Uganda.

1.4 Energy management

CREEC provides training, research and consultancy services to industrial companies and institutions on the optimum utilization of energy to minimize costs and increase profits. The goals of good energy management are three-fold: globally, reduced energy consumption, especially in the larger industrial companies, mitigate the effects of climate change; nationally, the need for building expensive new generation is delayed as saved demand makes more power available and mitigates load shedding; and individually, both companies and individuals enjoy better quality energy utilization at reduced cost.

1.5 Others

Apart from the services mentioned above in CREEC's main technologies of focus, the centre is also engaged in cross-cutting projects. CREEC finalized an energy study for Wildlife Conservation Society with regard to the use of renewable energy for institutions in Northern-Uganda to decrease deforestation in protected areas. Another example of a cross-cutting project is the MSI project from a group of researchers of College of Engineering, Design, Art and Technology. The research program involves three PhDs focusing on GIS mapping, appropriate energy conversion technologies and business models. The programs are being executed with the implementation of four energy pilot plants (two bioenergy, one solar and one pico-hydro). CREEC is supporting the research team in technical design and implementation of the pilot plants and project management, such as budget control and reporting. The project is financed by the World Bank and the Government of Uganda through the Uganda National Council for Science and Technology. *Additional and detailed work done by CREEC can be provided upon request.*