



COLLEGE OF DEVELOPMENT STUDIES

CENTER FOR ENVIRONMENT AND SUSTAINABLE

DEVELOPMENT

UNHCR Environmental management: practice, effects, challenges and its relation with environmental security: case of Tierikidi Refugee Camp, Itang Worda, Gambella Regional state, Ethiopia

By: Assefa Negussie

ADDIS ABABA

August, 2020

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**A THESIS SUBMITTED TO COLLEGE OF DEVELOPMENT STUDIES
CENTER FOR ENVIRONMENT AND SUSTAINABLE DEVELOPMENT
IN ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF
ARTS IN ENVIRONMENT AND SUSTAINABLE DEVELOPMENT**

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**ADDIS ABABA UNIVERSITY COLLEGE OF DEVELOPMENT STUDIES
CENTER FOR ENVIRONMENT AND SUSTAINABLE DEVELOPMENT**

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Acknowledgements

For most I would like to express my deepest gratitude to my sincere advisor Dr. Engedawork Assef for his wonderful guidance, support, patience, constructive comments and suggestions through which they have guided me in all the stages of this research. Without his meticulous and deep reading to my research from the beginning to the end, the researcher would not have been successful in preparing it in this way.

Besides my advisor, my sincere thanks go to Getachew Muche staff member of UNHCR, Girmay Kassa staff member of ARRA. All staff members of ARRA, UNHCR, ZOA, NRDEP and DRDIP in Addis Ababa, Gambella, Itang and at Tierkidi refugee camp who participated in this study. Finally, Special thanks to the refugee community members who willingly participated in this study.

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Aberrations

ARRA	Agency of Refugee and Returnees affaires
EEWG	Energy and Environment Working Group
FCC	Fuelwood Crisis Consortium
NRDEP	Gambella region Natural Resource and Environmental Protection
IGOs	International governmental organization
DRDIP	Ministry of agriculture development response to displacement impact project
NGO	Non-governmental organization
RC	Refugee council
SAFE	Safe access to fuel and energy
SGBV	Sexual and gender-based violence
SDGs	Sustainable Development Goals
ICRC	The International Committee of the Red Cross
OAU	The organization of Africa Union
RARP	The Refugee-affected Areas Rehabilitation Programme.
IPCC	The United Nations' Intergovernmental Panel on Climate Change's
UN	United nations
UNEP	United Nations Environmental Protection
UNGA	United Nations General Assembly
UNHCR	United Nations High Commissioner for Refugees

Abstract

From the review of the literature and in-depth study on environmental problems, it can be concluded that there is insufficient information regarding the negative impact of refugees and host community on environment and its impact on environmental security; the nexus between environmental management of UNHCR and environmental security in and around tierkidi refugee camp. The main aim of this study are to investigate the practices, effects and challenges of environmental management by UNHCR in and around Tierikidi refugee camp and its relations with the environmental security. The findings are more emphasized and analyzed qualitatively and quantitatively in light of primary sources gathered by questionnaires, interviewing and the study used purposive sampling technique and Spatial (GIS) Data collection and analysis. The result of this research show that environmental degradation in and around Tierkidi refugee camp resulted mainly because of refugee and there is sever conflicts between host community and refugee due to scarce resource(environmental insecurity). Consequently, the impact of environmental deterioration on the refugees themselves and host community is intense. To solve thses problem UNHCR has been taken different environmental mangemnt practices . The result indicated that Despite the implementation of various environmental management projects intended to prevent future degradation and rehabilitate already degraded areas, resource depletion and degradation is still a significant problem for both refugees and host community. On this basis, it is recomended that there should be effective corrective measure like decreasing the number of refugees to the standard, increased environmental awareness raising, increase budget for environmental management (mitigation)activities, creating income generating activities, continuous and participatory conflict resolution measures ,effective and fruit full coordination among different stake holders and generally there should be effective actions or measures to be taken to come in to being Optimistic scenario in and around tierkidi refugee camp.

Keywords : environment, degrdation, environmental management, environmental secutiry, refugees,host communit, conflicts

Unit one

1.Introduction

1.1 Background

The influx and presence of refugees has additionally been appeared now and again to impact-sly affect people inside a host community or even on the whole community in general especially cause for environmental degradation and natural resource depletion. “Environmental problems are now prominent political issues as a consequence of the increased scale of consumption and pollution in modern high-energy societies, which has caused large decreases in primary forest cover; biodiversity losses; depletion of fish stocks; land degradation; water pollution and scarcity; coastal and marine degradation; the contamination of people, plants, and animals by chemicals and radioactive substances; and climate change and sea-level rise”(J. Barnett; 2009:1).

The main ecological issues influencing Ethiopia incorporate soil erosion and land debasement (encompassing effects on forests, agricultural and pastoral land), deforestation and forest degradation, water shortage, biodiversity loss and different sorts of pollution issue.The main drivers of environmental degradation in African nation embrace high increase, high urbanisation rate, further as an economic process that's for the most part driven by agricultural production, infrastructure growth and increasing energy demand. The magnitude of displaced person deluge in African nations as of late has created worry all through the world. Broadly saw as an uncommon crisis, these flows have created a blend of compassionate worry of the a great many individuals constrained into outcast and dread for the likely danger to the social, financial and political security of host states brought about by surges of undesirable newcomers. Host people group are the most influenced by the refugee influx having less access to administrations than outcasts which thus prompts strain and possible clash among exiles and host community. Such clash happens for various reasons, for example, rivalry over scarce resource or services which results environmental insecurity.

Environmental security can be viewed as being about the effects of human activities on the earth, ecological change can be viewed as a security issue regular to all states, consequently requiring aggregate action, ecological change can be viewed as a danger to national security and environmental change has been recognized as a potential reason for vicious clash and can be

viewed as a risk to human security. “The growth of environmental consciousness in developed countries was necessary for environmental problems to be seen as serious enough to warrant calling them a security issue. This began in the 1960s with some high-profile studies of environmental problems and growth in the number of environmental nongovernmental organizations, including the creation of large, international, environmental nongovernmental organizations, such as the World Wildlife Fund, Friends of the Earth, and Greenpeace”(J. Barnett; 2009:1).

“The Office of the United Nations High Commissioner for Refugees (UNHCR) was originally established by the General Assembly of the United Nations for a three-year period from January 1, 1951, to December 31, 1953, but it has since been voted successive five-year extensions through 1958, 1963, 1968, and 1973” (<https://www.nobelprize.org/>).UNHCR Policies on Instituting participatory Systems for Environmental Mitigation is clearly the task of the expatriate department inside the individual ministry of the host government. However, since most host governments face the typical capacity constraints of developing countries, UNHCR has made it official policy to initiate and facilitate the necessary process. In the UNHCR Environmental Guidelines (1996) ‘local participation’ is one of the four ‘Principles of UNHCR’s Environmental Activities’. The solutions to resulting environmental problems must be tackled with the participation of all parties concerned and an understanding of the interdependence of refugee assistance operations and local resource management practices.

UNHCR and its accomplices have turned out to be increasingly mindful of the need to stick to sound environmental management rehearses, and keep away from degradation where conceivable. With an end goal to carry more prominent advantages to refugee, orchestrate relations with neighborhood networks and host governments and assurance shelter, those working with refugee should progressively attempt to execute systems that continue the nearby condition and natural resource for current populaces and who and what is to come. refugee and relief agencies should plan mitigate and rehabilitate negative refugee related impacts on the environment, impact of environment on host community and refugees and its effect on environmental security. Such dedication requires the joining, to the best degree conceivable, of sound environmental management rehearses into all periods of refugee tasks. Best practices should be advanced and applied at the field level, especially in project planning, implementation,

management and monitoring. Environmental issues also need to be taken into account in training sessions, public awareness and information programs, and fundraising events. These objectives are at the core of UNHCR's own environmental strategies.

The 'Role of UNHCR' is described in the Environmental Guidelines as follows "UNHCR has a primary responsibility for integrating environmental considerations into all of its decisions and activities affecting the protection and well-being of refugees. UNHCR, together with government, must jointly promote environmental protection and rehabilitation in the field, by setting objectives, priorities and policies, by overseeing the design and implementation of environmental projects, through monitoring, and by coordinating the efforts of all the parties concerned. UNHCR should also promote links with other UN agencies and strive to achieve a consistent approach in the responses taken" (UNHCR, 2005:13).

"Ethiopia is host to the second largest refugee population in Africa, sheltering 905,831 registered refugees and asylum seekers as of 31 August 2018" (UNHCR,2019:1). The fundamental parts of UNHCR's condition bolster program in Ethiopia include: Environmental protection pilot project in the eastern camps: establishing tree nurseries and plantations - Ecological recovery and protection exercises at Kebribeyah and Hartisheik have indicated empowering prospects, albeit, given the size of ecological issues in eastern Ethiopia, the quick neighborhood effect of these pilot tasks will be restricted. They will be that as it may, fill in as helpful show ventures which could be repeated somewhere else in Ethiopia.

Being relied on the above arguments, the focus of this study was to investigate the nexus between environmental management of UNHCR and environmental security in and around tierkidi refugee camp.. Therefore, this paper intended to assess the negative impact of refugees and host community on environment ,the nature, processes and extent of UNHCR environmental management,Impacts of UNHCR environment mitigation programmes , Challenges of effective implimantation of UNHCR environmental management , the state of environmental security and factors affecting it in and around Tierkidi refugee camp.

1.2. Statement of the problem

Displaced people in Ethiopia are situated in Tigray Regional State and the four Emerging Regions of Ethiopia: Afar Regional State; Benishangul-Gumuz Regional State; Gambella

Regional State; and the Somali Regional State. The Emerging Regions are the least evolved areas in the nation, portrayed by cruel climate conditions, backward infrastructure, low regulatory capacity, an elevated level of poverty and poor development indicators. The arid environment in Afar and Somali regions and the small and scattered nomadic populations make it more challenging to provide services. Many parts of the four regions are inaccessible with poor or no roads. Refugee camps and settlements frequently happen in environmentally sensitive regions.

In Ethiopia, refugees as a rule have been settled in semi-arid, agriculturally marginal regions. Refugee camps will, in general, be enormous for both strategic and political reasons (UNHCR, 2018). These huge camps have a more negative effect on the environment than would be the situation if a few significantly smaller camps, catering for the same total numbers, were set up. Besides, refugees frequently need to remain in their nations of shelter for broadened periods, and the effect on the environment around camps might be drawn out. Environmental issues exist all through the world, however, many arrive at an overstated scale where enormous quantities of people are constrained together through a common sense of survival. “Unchecked human population growth applies pressure on the environment” (<https://www.science.org.au/>). The opening of the refugee camp in Tierikidi by the Ethiopian Government, with help from UNHCR implied that the number of inhabitants here was expanded unexpectedly. The driving forces are fundamental in a type of population growth (Influx of refugee) in the study area and very short time results - in immense interest of water, food and different necessities from nature, Energy consumption (fire wood), Need of construction material from nature, Infrastructure development and etc. affects natural resource resulted change. This led to an expansion in social and economic activities coming about into high demand for food and different utility from the natural environment.

There could be a variety of reasons why refugees is exceptional resource degraders. To that extend, depends mostly on the type of help and on the frame conditions that support or hamper their integration in an exceedingly property management of scarce natural resources. The environmental carrying capability of an exile hosting space is that the underlying idea of the notion that refugees influxes cause harm just by the (sudden) increase in population. however

carrying capacities don't seem to be fastened, they rely upon management and technology levels and on the extent of different inputs into the world of concern.

“The large-scale arrival and prolonged presence of refugees can have negative impacts on the environment” (World Refugee Council ,2018:4). “Environmental problems are now prominent political issues as a consequence of the increased scale of consumption and pollution in modern high-energy societies, which has caused large decreases in primary forest cover; biodiversity losses; depletion of fish stocks; land degradation; water pollution and scarcity; coastal and marine degradation; the contamination of people, plants, and animals by chemicals and radioactive substances; and climate change and sea-level rise” (J. Barnett; 2009:1). Among the foremost vital issues related to refugee-affected areas are deforestation; de-vegetation; soil erosion; the destruction, degradation and pollution of water sources and structure areas; hot preparation and fishing; and overgrazing. In some cases, locals are needed to surrender tillable land for the development of Tierkidi refugee camp ; forests are also stripped as refugees want poles for homes and latrines, firewood, medicine, thatching and fodder, and fuelwood. Likewise, significant trucks that transport food and alternative relief might harm roads. Since environmental degradation (deforestation, soil erosion ,water pollution and contamination e.t.c) and conflicts between refugee and host community because of scarce resource (low or weak environmental security) are unavoidable marvels in and around Tierkidi refugee camp. And coordinated and the correct reaction to the difficulties and the dangers ought to be taken by the various partners in the study area are insignificant.

“Environmental security can be seen as being about the impacts of human activities on the environment, environmental change can be seen as a security problem common to all states, therefore requiring collective action, environmental change can be seen as a threat to national security and environmental change has been identified as a possible cause of violent conflict and can be seen as a risk to human security’(J.Barnett;2009:1).“Over the last decade, the relations between long-term refugees and host populations in Ethiopia have become more antagonistic. The two populations now see themselves as competitors and the host communities have complained about the environmental degradation that has characterized refugee activities” (Agblorti, 2011, Samuel Kofi Miledzi Agblorti;2016:16). Subsequently, particularly for the Tierkidi refugee camp, the friendly hospitality, which ordinarily describes the emergency period

of displaced person arrival, has disappeared. Conflict between refugees and host populations over access to environmental resources such as forest products, water and agricultural land has been widely documented in Tierkidi refugee camp. The foundation of the Tierkidi camp in Itang in Gambella led to natural resource -based conflicts and caused ecological debasement. This isn't the only thing that cause conflict, the new framework which worked for the displaced people by worldwide organizations like UNHCR were not available for the local communities, who didn't have any of those infrastructures and facilities or regardless of whether there are, they are not adequate. It is obvious to such an extent that the appearance of these displaced people causes ecological problems and a competition over the scarce natural resources of the refugee's camp region with the host community. Also, and in some cases, led to conflict i.e. low or weak environmental security (environmental insecurity) which cost lives and still kept on costing.

The study site and organization were chosen for various reasons. To start with, Tierkidi refugee camp is one of Ethiopian government and UNHCR's priority to reduce environmental problems caused by refugee. Second, the UNHCR is the fundamental and the key player organization exceptionally included decreasing negative ecological effects brought about by refugee in Ethiopia and the world also. Third in and around Tierkidi refugee camp is one of biggest conflict between refugee and host community because of scarce resource. Despite the fact that to the extent my insight, no one deals with the practice of organization like UNHCR to reduce refugee impacts on the surrounding environment, there are plenty of studies on the impact of refugees on the home population socio economic activities and environment such as (Endalkachew Girma 2016, Prof. John O. Oucho, 2007, Getachew Fetene, 2009). In contrast to these studies has little reports. e.g. in 1997 UNHCR and expert participants at several international conferences were prepared a report on refugee operation and environmental management, selected lesson learned. This report selected best practices from 10 refugee-hosting countries. For example, the report selected two best practices from Ethiopia i.e. Supporting local organizations for sustainable re-integration: The Fethwul Harawe, and area closures for natural regeneration: Tigray, Ethiopia. This report and other studies had not considered environmental mitigation that are taken by UNHCR in and around Tierkidi refugee camp, environmental security and its relation with environmental management.

Cognizant to these all, the study chose to pursue an in depth study on the environmental management of UNHCR, the impacts of UNHCR environmental management or mitigation practices on the life of refugees and the host communities, environmental security and the relation of environmental management and environmental security in and around tierkidi refugee camp in Itang special Woreda, in Gambella Region.

1.3 Objectives of the Study

The general objective of this study is investigate the practices, effects and challenges of environmental management by UNHCR and its relations with the environmental security in and around Tierikidi refugee camp

1.3.1 The specific objectives are: -

- To assess status of land use and land cover change in and around the study area.
- To assess the nature, process and extent of UNHCR environmental management practices and challenges of UNHCR environmental management.
- To examine the impacts of refugees on environment and its subsequent impacts on refugees and host community.
- To explore the relationship between environmental security and UNHCR environmental management .

1.4 Basic Research Questions

This study answered the following question: -

- What is the nature and rate of land use and land cover change?
- ,Why, with whom and how does the UNHCR govern environmental problems?
- What are the challenges of UNHCR environmental management and environmental security?
- What is the relation between UNHCR environmental management and environmental security in the study area?

1.5 Significance of the study

- The results recommendation of this study helps the practitioners and low makers how to improve the existing situation of environmental degradation management and help to solve the challenges of refugee caused by degraded environment in and around refugee camps.

- It is an initiation idea for those who want to carry out further studies on practices and conservation measures of governmental organization around refugee camps.
- It helps to reduce the burdens or challenges of refugee because of degraded environment in and around refugee camps.?
- It provides information and thereby it helps to united nations housing commission for refugee (UNHCR) and the government of Ethiopia to improve their intervention in environmental problems around refugee camps.
- The researcher also believes that there are no enough researches have been conducted regarding this topic, so the study is a spring board for further research on this issue.

1.6 Scope of the study

This research aimed, spatially the study area covers in and around Tierkidi refugee camp. Conceptually, the study mainly focused on the practice and conservation measures taken by UNHCR in the study area to reduce environmental degradation caused by refugee. For this study the practices i of UNHCR to reduce environmental degradation in the study area was evaluated based on environmental guideline of UNHCR and by comparing different UNHCR programs to support refugees with environmental degradation activities taken by the organization in the study area. The target populations were refugee and host communities that are engaged or participate environmental protection practices and directly and indirectly affected by environmental problems, United Nations Housing Commission for Refugees (UNHCR), Ethiopian Environment, Forest and Climate Change Commission, (EFCCC),Ethiopia Refugee and Returnees' Affairs in federal and regional level (ARRA), ZOA Ethiopia ,Ministry of agriculture development response to displacement impact project (DRDIP), Gambella region Natural Resource and Environmental Protection (NRDEP). and other NGOs and IGOs which are involved in environmental practices in the study area.

1.7. Limitations of the study

To conduct the research as required, the following shortcomings had encountered.

- Covied19 was very challenged for data collection due *to quarantine all individual s and governmental and non-governmental workers, senior and junior expertise and officials are stayed at home, and all libraries in the city including Addis Ababa university closed.*
- Lack of peace and security were a problem to collect the data in the study area
- Othere limitiaons of the study include :shortage of time, budget, and data shortage .

However, having a field assistant who is familiar with the region and the people reduced some of the limitations with regard to data collection. And I collected most of the data by /through telephone,email and whats up communication.

1.8 Organization of the Study

This study is organized into four major units. unit one is the introductory section, which deals with the background of the study, statement of the problem, research objectives, research questions, Significance of the study (justification for the need of the research). Scope of the study, and limitations of the study and organizations of the study. Unit two Conceptual framework, theoretical frame work and literature review focuses on Refugees and the Environment, Environmental security ,Current overview of refugees in Ethiopia, Major causes of environmental degradation in and around refugee camp, UNHCR and environmental management, conceptual framework, literature review and theoretical framework. Unite three is Research Methodology Focuses on Description of the study area, Research design,Sample size and Sampling Technique,Source of Data,methodology and methods of data collection and analysis and Spataial Data collection and analysis (GIS), unit four is *Results and Discussion part such as*, impact of refugees on environment and degraded environment on host community and refugees in and around Tierkidi refugee camp; *Nature, processes and extent of UNHCR environmental management*; Impacts of UNHCR environment mitigation programmes in and around Teirkidi refugee camp; Challenges of effective implementation of UNHCR environmental management; the state of environmental security and facters affecting ,the state and trends of environmental security in the study areas,Factors that affect environmental security in and around refugee camps,Nexus of environmental management by UNHCR and environmental security,the interaction of environmental management and environmental security,the future scenarios of the nexus of environmental management and environmental security; Conclusions and Recommendations.

Unit two Literature Review

2.1 Concepts and Definitions

Refugees; The organization of African states (OAS) convention Article 1 sub-article 2 states refugee as any person compelled to leave his/her country owing to external aggression, occupation, foreign domination or events seriously disturbing public order in either part or the whole of his country of origin or nationality, is compelled to leave his place of habitual residence in order to seek refuge in another place outside his country of origin or nationality” (OAS, 1969:3).

A refugee camp; is intended as a temporary accommodation for people who have been forced to flee their home because of violence and persecution. They are constructed while crises unfold for people fleeing for their lives. These hastily built shelters provide immediate protection and safety for the world’s most vulnerable people. Camps allow UNHCR to deliver lifesaving aid like food, water and medical attention during an emergency (UNHCR, 2019:1).

Environmental degradation; is the deterioration (causing degenerative harm) of the environment through exhaustion of natural assets such as water, soil, and air including the ecosystem, habitat intrusion, wildlife extermination, and environmental pollution (World Atlas, 2018:2).

Environmental protection; is Environmental protection refers to any activity to maintain or restore the quality of environmental media through preventing the emission of pollutants or reducing the presence of polluting substances in environmental media. It may consist of: prevention of degradation of the landscape and ecosystems (Glossary of Environment Statistics 1997:1).

Deforestation; The conversion of forest to another land use or the long-term reduction of the tree canopy cover below the minimum 10 percent threshold. OR Deforestation implies the long-term or permanent loss of forest cover and implies transformation into another land use. Such a loss can only be caused and maintained by a continued human-induced or natural perturbation (FAO, 2007:9).

Soil degradation; is the decline in any or all of the characteristics which make soil suitable for producing food. Soil degradation occurs through the deterioration of the physical, chemical and

biological properties of soil that results in soil compaction, salinization, acidification, and soil loss from wind and water erosion (sustainable food trust,2015:1).

Water degradation; is the misuse and also the pollution of water supplies. Often, individuals throughout the world have to deal with either limited water supplies, or polluted water, often caused by human actions (International relations .org,2015:2).

Water pollution;The release of substances into subsurface groundwater or into lakes, streams, rivers, estuaries, and oceans to the point where the substances interfere with beneficial use of the water or with the natural functioning of ecosystems. In addition to the release of substances, such as chemicals or microorganisms, water pollution may also include the release of energy, in the form of radioactivity or heat, into bodies of water(Nathanson J.A, 2000:6).

Land degradation; is defined as a negative trend in land condition, caused by direct or indirect human-induced processes including anthropogenic climate change, expressed as long-term reduction or loss of at least one of the following: biological productivity, ecological integrity or value to humans (IPCC special report, 2019:5).

Environmental security is the state of human–environment dynamics that includes restoration of the environment damaged by military actions, and amelioration of resource scarcities, environmental degradation, and biological threats that could lead to social disorder and conflict (Keele University,1997:6).

Environmental management is consists of organizing different environmental initiatives to address various ecological issues that are affecting the globe(Safeopedia,2017:1).

2.2 Refugees and the Environment

For refugees in developing nations, the natural environment is highly linked to economic welfare. Refugees are subject to their surroundings for water, food, shelter, and medicine. for example, refugees are firmly connected with the well-being of the environment, the natural environment is everything for refugees that is it gives water, energy, construction material, medicine, food, income generating and generally livelihood for refugees. Thusly, the Refugee hosting environment is characterized by its biological, geographical, social, economic and medical implications as the 'livelihood environment' for refugees. “Refugee settlements often occur in environmentally sensitive areas. In Africa, refugees have therefore usually been settled

in semi-arid, agriculturally marginal areas, or (as in the case of the Rwandese in DRC) near national parks or forest reserves. Refugee camps tend to be large for both logistical and political reasons. These large camps have a more negative impact on the environment than would be the case if several considerably smaller camps, catering for the same total numbers, were set up. Furthermore, refugees often have to stay in their countries of asylum for extended periods, and the impact on the environment around camps may be prolonged”(Gill Shepherd, 1995:1). Refugee floods heighten normal green environmental problems – those related to over-exploitation of natural resources due to poverty, rising populations, feeble property rights, and inappropriate management.

“The spontaneous movement and displacement of large numbers of people may have significant impacts on the environment. Arriving in an alien situation, refugees face hunger, fatigue, humiliation and grief. Their first concern is to look after themselves” (UNHCR,2001:1). Rivalry for natural resources, for example, fuelwood, building materials, freshwater, and wild foods is a quick concern, most often to find food and shelter. Trees are felled to offer help for simple safe houses. Deadwood is gathered to fabricate a fire for warmth and as fuel for cooking. With only a few families involved, the environmental effects are probably not going to be too genuine or enduring. With a large number of desperate people, however, the outcomes can be disastrous for the environment. What is awful for the environment is eventually terrible for refugee welfare.

The unconstrained nature of migration by refugees means that refugee host nations, for the most part, do not have the methods and assets to create procedures around the use and management of environmental infrastructures frameworks, for example, water, energy sources, land use, and management among others. The after effect of this absence of clear direction has led to the massive deterioration of land resources at many sites and a general traded off natural capital of the nations that play host to these refugees. So as to guarantee that facilitating refugees holds fast to environmental sustainability, it is critical to actualizing techniques that to sustain the local environment and natural resources for the benefit of human wellbeing and biodiversity. Creating techniques that guarantee the presence of refugees does not have negative effect on the environment, where refugee camps are set up, measures are put in place to protect both the environment and the refugees and in fact sustainably manages the benefits the environment can offer to refugee, ought to be a pre-essential for organizations working with refugees.

2.3 Environmental security

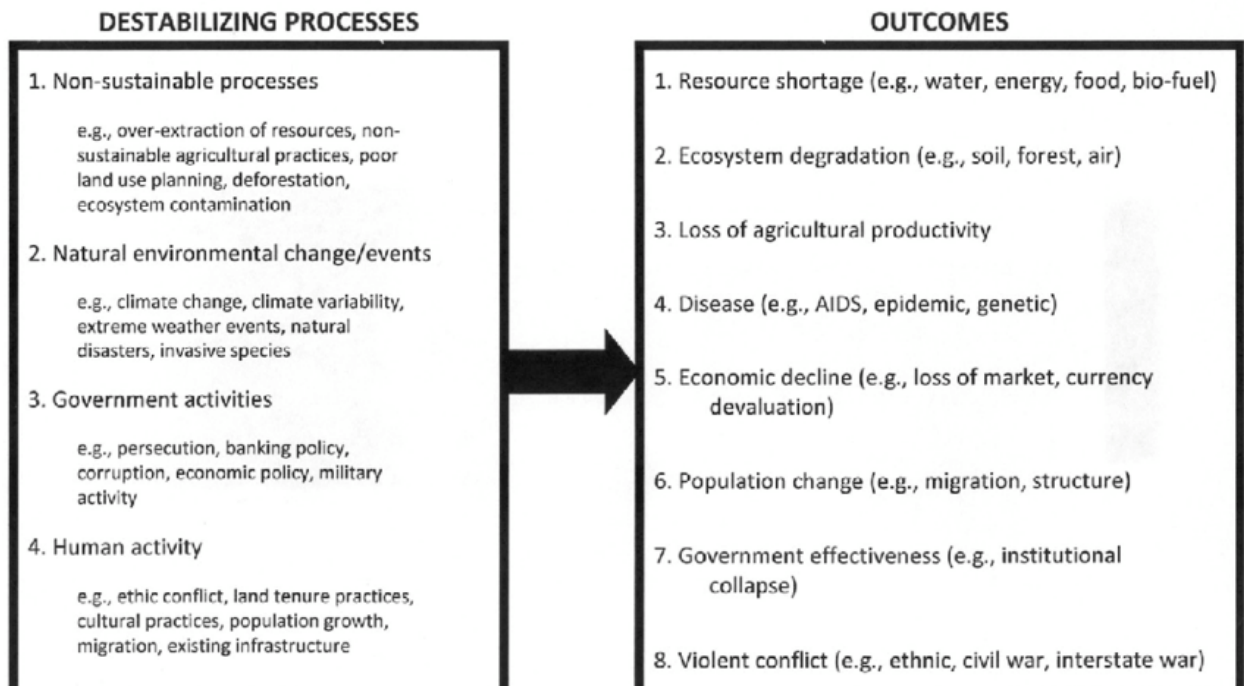
Even though in general term Environmental security focuses more on preventing conflict and loss of state authority due to environmental factors, as well as the additional military needs to protect their forces from environmental hazards and repair military-related environmental damage, there isn't yet a comparative all-inclusive meaning of environmental security. For instance. Environmental security is the state of human–environment dynamics that includes restoration of the environment damaged by military actions, and amelioration of resource scarcities, environmental degradation, and biological threats that could lead to social disorder and conflict(Keele University,1997:6).

Environmental security is the relative public safety from environmental dangers caused by natural or human processes due to ignorance, accident, mismanagement or design and originating within or across national borders(Keele University,1997:8). The definition exhibited beneath sets the limit conditions for this paper, however, it isn't indicated to be a last, comprehensive meaning of environmental security. Environmental security is a process for effectively responding to changing environmental conditions that have the potential to reduce peace and stability in the world. Environmental security involves identifying the critical issues and accomplishing environmentally related actions to prevent and/or mitigate anthropogenically induced adverse changes in the environment and minimize the impacts of the range of environmental disasters that could occur (King, 2000:17).

Environmental scarcity is determined by environmental change, population size and growth, and unequal distribution (or access to) resources. Of these factors, unequal access to resources is not bound by physical limits alone. It is also a reflection of societies' preferences, beliefs and norms. Leading examples of emerging environmental change are: depletion and pollution of fresh water supplies, depletion of fisheries, degradation and disappearance of biodiversity, degradation and loss of agriculture lands, food and health safety, stratospheric ozone depletion, and global warming. “Of these major environmental changes facing humankind, the first five are now, or will likely be, growing threats to environmental security in the near term; the latter two will increasingly affect human security in the coming 50 years” (<http://www.envirosecurity.org/>). components of environmental security, for example, - food security, water security, security from irresistible infection, security from exposure to dangerous waste, and so on shows itself in individual lives, family units, communities, areas, country states, all-inclusive ("communities "

here incorporates those as traditionally defined and others less frequently described as woman, ethnic groups, and so on). environmental security at the higher levels ought to be seen as rooted in security at the lower ones. generally, this paper utilized the term "environmental security" in a substantially more prohibitive way than do many existing definitions found for environmental security in the literatures. Here the term is applied explicitly to mitigation of conflicts and tensions between refugee and host community caused by scarce natural resource due to environmental degradation

Fig 1 Environmental Security Framework for Conflict Analysis



Source: Modeling Environmental Security in Sub-Saharan Africa; Amy Krakowka Richmond on 17 May 2014:26

2.4 Current overview of refugees in Ethiopia

With Ethiopia being a poor however stable nation assuming on huge liability in the area by keeping up an open-entry way strategy for refugees and by facilitating one of Africa's biggest refugee population. “Ethiopia has a long-standing history of hosting refugees. In 2004, a National Refugee Law was enacted based on the international and regional refugee conventions to which Ethiopia is a party. Currently (2018), the country is host to some 905,800 refugees, the majority from South Sudan (46.6%), Somalia (28.4%), Eritrea (19.2%) and Sudan (4.9%). As conflicts are ongoing in neighboring countries, refugees continue to enter Ethiopia on a daily basis, making it the second largest refugee-hosting country in Africa” (UNHCR,2018:1). Ethiopia host more than 900,000 enrolled refugee and is the second biggest refugee facilitating nation in Africa after Uganda. Ethiopia has had an open-entryway approach for refugee since its present government came to control in 1991, allowing refugee the privilege to live in Ethiopia in authoritatively assigned camps overseen by the Agency for refugee and Returnee Affairs

(ARRA) with the help of United Nations High Commissioner for Refugees (UNHCR) and other humanitarian partners. Most refugees are situated in the outskirts districts of A remote place, Benishangul-Gumuz, Gambella, Somali, and Tigray regional States, Three out of the four of the Developing Regional States are major refugee-hosting regions, putting pressure on already scarce resources and services, and a continued influx of refugees into Ethiopia puts pressure on the local environment and resulted severe degradation.

2.5 Major causes (driving forces) of environmental degradation in and around refugee camp

2.4.1. Hosting a large population in a small area.

During the 1990s, UNHCR turned out to be progressively mindful of the ecological difficulties related with facilitating a huge populace in a small area. Rivalry over scarce resource, for example, firewood, water and grazing area, created animosity and sometimes started grinding or struggle among displaced people and host communities. proof exists to exhibit that huge scale disengagement of people, normal for some ongoing refugee crises, make unfriendly natural effects. The scale and suddenness of refugee flow can quickly change a circumstance of the relative wealth of natural resource to one of intense shortage here the hosting environment is already under stress, as it is for instance in many arid regions of Africa and Asia, an influx of refugees can seriously threaten the integrity of local ecosystems, the economic activities dependent on them, and the welfare of local communities.

In spite of the fact that deforestation will, in general, be the most obvious negative ecological element of refugee circumstances other visible impacts may include soil erosion, loss of wildlife and non-timber products, and loss of biodiversity. Indoor and open-air pollution brought about by the concentrated utilization of biomass fuels, consumption or sullyng of aquifer and an altered pattern of transmission of certain diseases tend to be less obvious impacts, but can nonetheless be a serious threat to refugee health.

2.6 UNHCR and environmental management

UNHCR has gotten progressively worried about the state and prosperity of the earth around displaced person camps and resettlement territories. Experience has demonstrated that the government assistance of individuals - regardless of whether displaced people is firmly connected with the prosperity of the earth. UNHCR, as the fundamental coordinating

organization for refugee assistance, needs to move towards a stronger role as an impetus for environmental mitigation with the support of local, national and international development organizations and host governments. Even though initially “UNHCR’s mandate is to protect the rights and dignity of refugees, a task it has undertaken for almost half a century. In recent years, it has also taken steps to safeguard the environment around refugee operations and to encourage management of natural resources with a view to long-term sustainability - a task in which UNHCR plays an important coordinating role, drawing expertise and assistance from other organizations.

To co-ordinate implementation and support of its field-based activities, in 1996 and 2005 UNHCR prepared Environmental Guidelines which lay out its operational policy and principles”(UNHCR,2001:3). That emphasis on refugees hosting is on investigating nature-based solutions opportunities, creating rules and giving vital help for refugees and host countries to guarantee sustainable natural resources use and management. This incorporates providing rules and guidelines that are responsive to natural resource management challenges including fuelwood, water, and land. This involves a comprehensive approach to natural resources management that likewise supports establishing provide energy, water, capacity building, income-generating activities and etc. for refugees to decrease overdependence on the natural environment and to mitigate environmental problems.

Environmental problems are consequently a basic piece of UNHCR has actualized measures to address these issues, UNHCR has set up projects and activities planned for improving feasible environmental management so as to lessen environmental degradation, incorporating furnishing refugee with eco-friendly stoves, sun oriented road light, and sun oriented lamp, and implementing environmental activities, for example, land recovery, planting of trees, natural effect appraisals, ecological mindfulness, safe access to fuel and energy(safe), monitoring and evaluation, and so on.

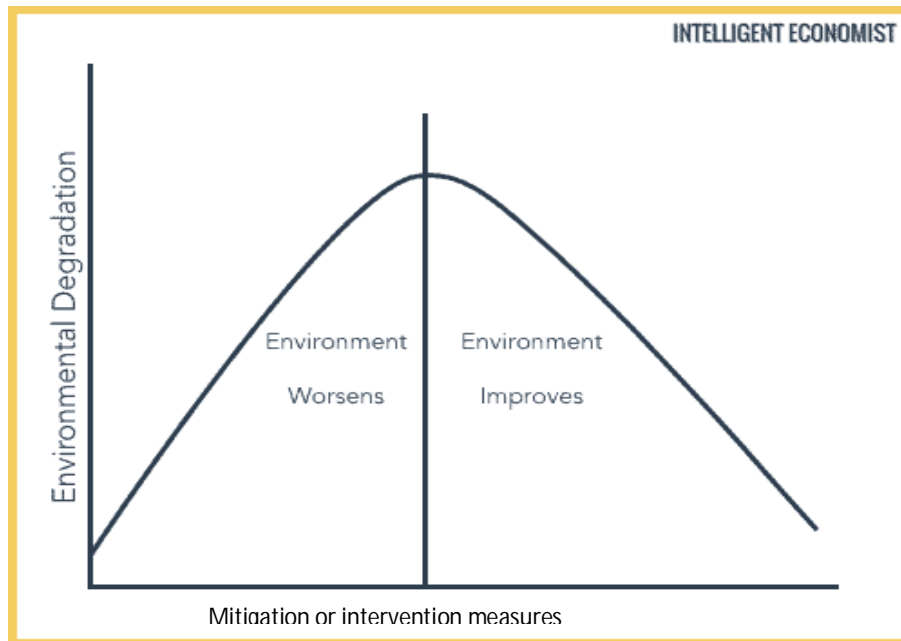
2.7. Environmental Kuznets Curve Theory

The environment is the host of all activities of refugees, likewise the activity of refugees viable here. The refugees well-being activities have a cyclic association with the environment known as “input-output” processes in which it receives the materials for survival from the environment and then gives a range of pollution such as waste, air, and water pollution, deforestation, etc.,

back to the environment as a result of the consumption and/or utilization processes. The relationship between mitigation (intervention measures) and environmental degradation is can be explained through environmental Kuznets curves theory. “Environmental concerns during refugee operations, UNHCR recognizes three main phases of assistance to refugees - emergency, care and maintenance and durable solutions - each of which requires specific attention. Environmental pressures too will differ between these stages, as well as from one situation to another” (UNHCR, 2001:1) .

In the process of refugee movement from origin to host environmental support capacity can be partitioned into three phases: During the huge influx of refugees moved to the host country (the emergency or first phase), the load on the environment increases continuously which causes the increments of environmental deterioration. The circumstance proceeds till it enters stagnate phase when the refugee settled properly, many national and international partners involved in identifying activities which will affect environment and refugees' safety, security and general well-being and refugees develop skill and knowledge about environmental degradation, to certain label (care-and-maintenance or second stage). Then the growth of environmental load slows down and inversely declines gradually once it reaches apex; In the third or durable-solutions phase, environmental degradation decreases because of :-refugee numbers are decreased because of local integration, resettlement, and voluntary repatriation and other different intervention measures i.e., environmental education and use of alternative energy source, sustainable livelihood and life support,. And the refugees continuously in coordination with nature, this mode enables that load on the environment reduces constantly till to a lower degree. This process is indicating the Environmental Kuznets Curve (EKC), is applicable in the process of refugee movement, that is, the environmental conditions will first decline and then gradually improve. (see fig 2below)

Fig 2: The inverted U Environmental Kuznets Curve



Source: intelligent economist, 2018:18

2.8. Conceptual framework

I utilized The Driving Force, Pressure, State, Impacts, (DPSIR). Response Conceptual Framework applied to potential land degradation and control interventions.

It is essential to comprehend the causes behind environmental degradation so as to identify suitable responses.

There are five parts of the DPSIR structure:

A. Driving Forces are fundamental in a type of population growth (Influx of refugee) or Influx of refugees in small area and Avery short time results in Immense interest of water, food and different necessities from nature, Energy consumption (fire wood), Need of construction material from nature, Infrastructure development and etc. affects natural resource resulted change.

B. Pressures from the driving forces have direct impacts on the environment. It includes Forest clearing for agriculture ,population pressure /growth,waste disposal, increase service demand, improper management ,Conservation gaps and Coordination gaps these incorporate forests clearing for agricultural production, city development on rural land, or contamination of land, water and air from water, and other human exercises. Pressures emerge from the incentive

structures created by the driving forces, as a result of the in proper management of environment, Conservation gap and Coordination gap.

C. State :- It refers environmental degradation i.e., for example, the state of the environment can be caught by evaluating the stock of natural resources, changes in them or ecological quality markers like , erosion levels, nutrient stocks, soil quality, pollution levels, changes in areas or quantities or amounts of carbon, and loss of species or environments. It includes Soil degradation and contamination,deforestation , Water contamination, Distraction and pollution of water and water sources and catchment,overgrazing

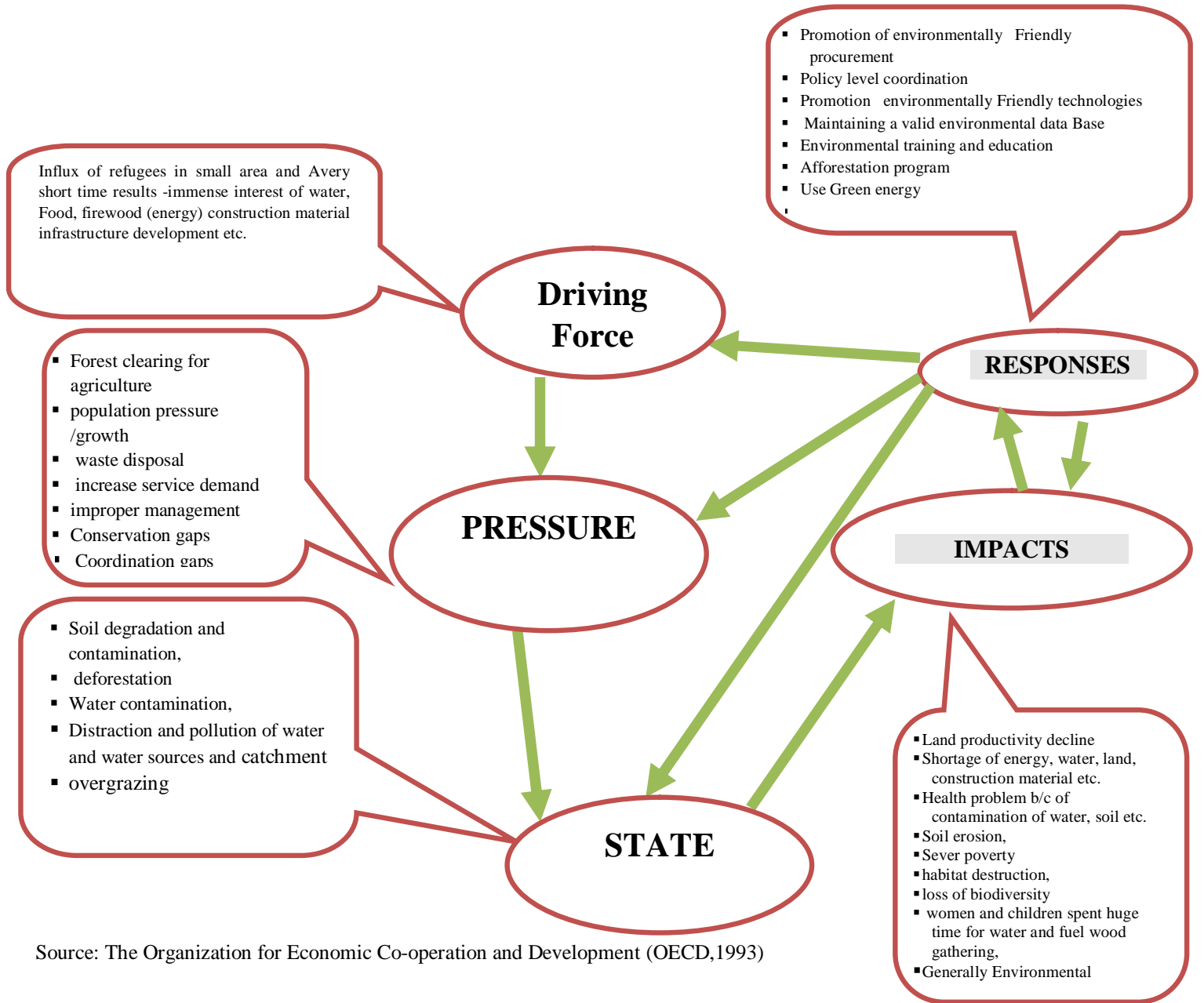
D. Impacts and challenges of refugee and host communities caused by degraded environment: - it includes Land productivity decline :-Shortage of energy, water, land, construction material etc, Health problem b/c of contamination of water, soil etc,Sever poverty,habitat destruction, loss of biodiversity, women and children spent huge time for water and fuel wood gathering and Generally Environmental degradation, shortage of resource competition, conflicts results environmental insecurity
Human Impacts of the changes in the environment are measured through a range of indicators, like poverty status, food security or other measures of vulnerability, such as shortage of water (water insecurity), shortage of food (food insecurity), shortage of firewood (energy insecurity), shortage of shelter, weak property right etc. generally low or week environmental security (environmental insecurity)

E. Intervention of UNHCR: - Reactions of UNHCR seek to reduce the environmental negative impact in areas hosting refugees through Forest and environmental protection and capacity building on environmental protection. They can address the Driving Forces, the Pressures, the State, Impacts and challenges of the Environment or Human Well-being. types of land-related environmental problems with soil, water and air pollution as the most severe refugee camp problems in many developing countries. Generally, it includes Promotion of environmentally Friendly mitigation activates such as alternative livelihood Policy level coordination,Promotion environmentally Friendly technologies e.g. Use Green energy, Maintaining a valid environmental data Base,Environmental training and education (awareness),Afforestation program (forest management)and Sustainable natural resource development which results high or strong environmental security. The DFPSIR framework can serve as a simple interdisciplinary starting point. The following diagram shows conceptual frame work of the study

2.9 Related Literature review

Despite the fact that nobody deals with the act of organization like UNHCR to lessen refugee impacts on the surrounding environment and environmental security, there are plenty of studies on the impact of refugees on the economic, socio-cultural, security and environment impacts, (Endalkachew Girma 2016, and 2018, Prof. John O. Oucho, 2007, Getachew Fetene, 2009) rather than to these studies has little reports. e.g. in 1997 UNHCR and expert participants at several international conferences were prepared a report on refugee operation and environmental management, selected lesson learned. This report selected best practices from 10 refugee-hosting countries. For example, the report selected two best practices from Ethiopia i.e. Supporting local organizations for sustainable re-integration: The Fethwul Harawe, And area closures for natural regeneration: Tigray, Ethiopia. This report and other studies had not consider environmental mitigation that are taken by UNHCR on Tierkidi refugee camp Therefore, the study identified the main negative impacts of refugee, the impact of degraded environment on refugee and the practice of UNHCR to reduce environmental problems, environmental security, and nexus of environmental management of UNHCR and environmental security, land use and land cover change in Tierkidi refugee camp Besides that the study compared different UNHCR activities to support refugee with environmental activities in Tierkidi refugee camp.

Fig 3: The DPSIR (Driving Force, Pressure, State, Impacts, Response) Conceptual Framework applied to potential land degradation control interventions.



Source: The Organization for Economic Co-operation and Development (OECD,1993)

Unit Three

Research Methodology

3.1 Description of the study area

Gambella Region is classified into three zones and one distinct Woreda (administrative unit). Gambella is divided into three zones and one special woreda i.e zones anuak, mezhenger, nuer zone, and one special woreda i.e Itang . Itang is the distinct Woreda which is situated in the Gambella district with its capital Itang town.(see figure4 below) It is bordered on the south and southeast by the Anuak Zone, on the west by the Nuer Zone, on the northwest by South Sudan, and on the north by the Oromia region; some portion of the southern limit is characterized by the Alwero River. The significant town in Itang will be Itang. The Itang Special Woreda encompasses 21 kebeles among which 95% are situated in the flood plain zones of Baro river basin. This special woreda covers an area of 2,188 km² with a total population size of about 35,686. According to the Central Statistical Agency, there are 22,824 Nuer, 9,175 Anuak. Besides, there are considerable numbers of people from other parts of the country inhabiting in the region (CSA, 2007:37-40).

“The climate of the region comes under the influence of the tropical monsoon from the Indian Ocean, characterized with high rainfall in the wet period from May to October and a dry period from November to April. The mean annual temperature of the region varies from 17.50 c to 28.30 c and annual monthly temperature varies throughout the year from 270 c to 330 c. The absolute maximum temperature occurs in mid march and is about 470 c and the absolute minimum temperature occurs in December and is about 10.40c. The annual rainfall of the Region in the middle altitudes varies from 900-1500mm, At higher altitudes, it ranges from 1,900-2000mm, at lower altitudes it varies from 900-1000mm. The annual evapo-transpiration in Gambella region reaches about 1612 mm and the maximum value occurs in March and is about 212 mm”(Woldesemayt Alemu,2007:7).

Geographically, the Itang town and most of other villages are located in the left and right banks of the river which provides ecological importance and sources of livelihood to the inhabitants. Cereals crops (sorghum and maize) vegetables, animal herding and fishing are the mainstays of the population in the woreda (Endalkachew ,2016:45). As indicated by the Atlas of the Ethiopian

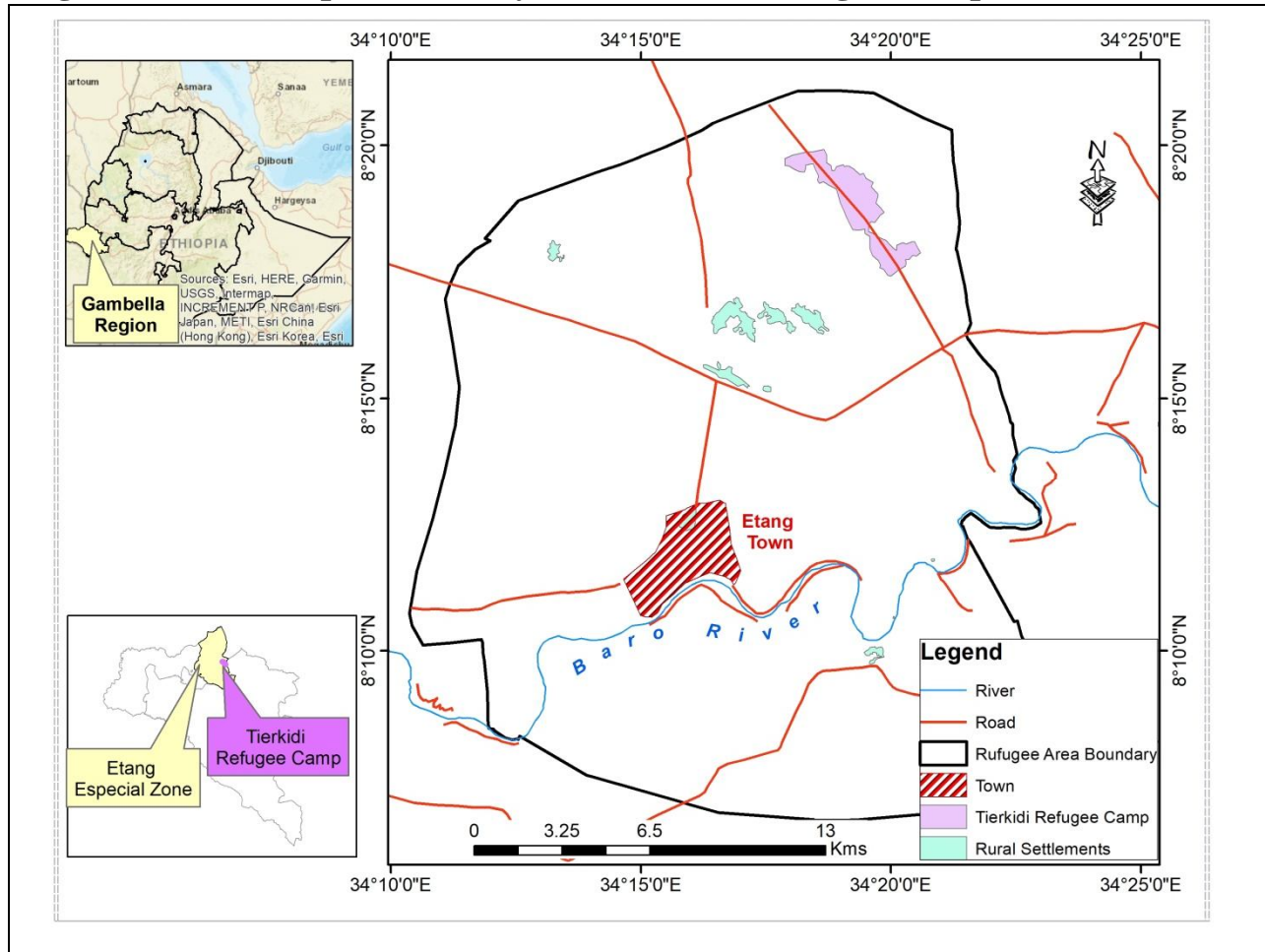
rural economy distributed by the central statistical agency (CSA), the territory is for the most part level; the elevation of this woreda ranges from 350 to 480 meters above the sea level; rivers incorporate the Baro, which the Alwero is a tributary of. around 10% of the woreda is forest and wood land. An eminent milestone is the Gambella National Park, which grasps the woreda south of the Baro. The economy of Itang is prevalent in agriculture.

As per the 1994 national census, the woreda's populace was accounted for to be 18,768 of every 17,156 family units, of whom 9,408 were men and 9,360 women; 2,106 or 11.22% of the population were urban occupants. The two biggest ethnic groups in Itang were the Nuer (47.74%) and the Anuak (46.68%); all other ethnic groups made up 5.58% of the population.

Tierkidi refugee camp was opened in Itang woreda for South Sudanese refugees. The area has once more the focal point of significant philanthropic activity for South Sudanese refugee. “As the refugee camps in Gambella quickly reached their capacity, Tierkidi Camp was opened on 17 May 2014 to receive the new arrivals, transiting mainly from Akobo, Pagak and Burbiey entry points. Tierkidi refugee camp has 72,722 refugees (UNHCR ,2018,1). The population is primarily comprised of refugees originating from South Sudan’s Unity, Upper Nile and Jonglei states. The refugees are predominantly ethnic Luo-Nuer. Primarily farmers and pastoralists” (UNHCR ,2014:1).

The camp is situated around 50 km from the outskirts to South Sudan. The vast dominant parts of refugees are ladies and youngsters who have strolled for a considerable length of time to arrive at the fringe, regularly without having had the opportunity or the likelihood to bring along nourishment for the venture. The social foundations of these refugees are overwhelmingly ethnic Luo-Nuer and their primary occupations are principally farmers and pastoralists.

Fig 4- Location map of the study area Tierkidi Refugee Camp



Source: Drive from Goggle earth 2020

3.2 Research design

Research design can be thought of as the rationale or all-inclusive strategy of a research that illuminates how the study is to be led or it is an arrangement for a study, giving the general structure to collect data. This research, used mixed research design that is the qualitative paradigm employed for the issues related to reasoning, justification or logical arguments and the quantitative paradigm such as Spataial Data collection and analysis (GIS)

had used for certain data, report and information that was collected, in conducted this study.

3.3 Sample size and Sampling Technique

Purposive types of sampling technique was used. Because it is more appropriate for this study since it focuses only on some category of the refugees, host communities ,expertise and selected sample on the basis of knowledge of the research problems to allow selection of appropriate

respondents for inclusion in the sample. Moreover, purposive type of sampling technique is good for exploratory, qualitative work. Sample size determination was used to obtain both a desirable accuracy and a desirable confidence level with least cost. Accordingly, the data collected from different institutions i.e UNHCR,ARRA,EFCCC,DRDIP,ZOA and NRDEP the study area have 954 refugees(house holds) ,616 host community(house holds) and 338 environmental expertise(house holds). Totally 1908 house holds/ persons who working on environmental related activities , trained on several environmental awearnes programs and persons who are engaged on fire wood and charcoal selling are target population.The study employed the following formula to get the sample size:I used Yamane's formula for calculating sample size : Yamane (1967) suggested simplified formula for calculation of sample size from a population which is an alternative to Cochran's formula. According to him, for a 95% confidence level and p=0.5 , size of the sample should be

$$n = \frac{N}{1+N(e^2)}$$

Where

N = is the population size

e = is the level of precion

p = is the estimated proportion of an attribute that is present in the population

let the formula used for my total taget population is 1908

assuming 95% confidence levele with ±10% precision.

P: the proportion in the target population to have specific characteristic. If no estimate available set at 50% (or 0.50)

e is the level of precion 0.05.

Accordingly

$$n = \frac{1908}{1+1908(0.05^2)}$$

n=95

As I mentioned above the total target population is 1908 ,from this refugees,host communities and environmental expertise constitutes 954(50%),616(30%) and 338(18%) respectively. Therefor the sample size for refugee 53,for host community 30 and for environmental expertise 12 total 95 persons .

3.4 Source of Data

The two sources of data, namely, primary and secondary data sources were utilized for this study.

3.4.1 Primary Data

To collect primary data form samples, the survey; personal observation, structured and semi-structured interviews and Spatial Data collection and analysis (GIS) were used.

3.4.2 Secondary Data

Literature review of different materials on problems of refugee on environment, challenges of refugee caused by degraded environment and UNHCR measures and activities to reduce environmental degradation around refugee camps was used. In addition to other international and national literatures, annual, quarterly, and other UNHCR reports, as well as manuals, directives, regulations proclamations, policies and other documents form Ethiopian refugee returnee commission or authority, Ethiopian environment, forest and climate change commission, and UNHCR head quarter office in Addis Ababa and other regional offices in Gambella Ethiopia were used .

3.5. Instruments of Data collection

To undertake this study as required, a mixed type of research design was framed in terms of using words (qualitative) and numbers (quantitative), or I used both closed-ended questions and open-ended questions (qualitative interview questions).

Thus, the instruments of data collection that were used in the stud for primary data are:

3.5.1 Questionnair

In my study, a questionnaire consisting of 33 questions was prepared and used similarly questionnaire for all respondents(53 refugees and 30 host communitites) those who are engaged in environmental activities and took environmental training's. This survey was used to generate data that could help me to compare the scope of UNHCR environmental management,to know impacts of refugees on environment,impacts of

degraded environment on refugees and host community and the degree of conflicts between refugee and host community(level of environmental security) in and around Tierkidi refugee camp. Two enumerators were employed from the local community based on their academic background and previous experience in conducting similar surveys. These enumerators were assigned to translated the questioners for those who did not speak English .Finally, the data was analyzed using as percent.

3.5.2 Interviews

The open-ended questions (qualitative interview questions) had prepared to answered by the concerned official and workers of Ethiopian refugee returnee commission or authority, Ethiopian environment, forest and climate change commission, and UNHCR head quarter office and etc. in Addis Ababa and other regional offices in Itang and Gambella Ethiopia were interviewed.

3.5.3 Personal observation

I visited the sample study areas (refugee camp environmental degraded and conservation area identified as of sample study areas).I had 3 days visite. The tour was from Addis to Gamebella by airplane and from Gambella to Tierkidi refugee camp by car. I observed and cheked the important facts that are collacted by quetinaries and interviews .In addation to this I collacted data the issues that did not collect enough information during quetionaries and interview from the refugee group leaders and host communities and governmental and non-governmental organizations environmental expertise that involved in environmental concerned activities.

3.6. Methods of Data Analysis

The method of data analysis was on both descriptive (quantitative) and inferential(qualitative) approach. The primary data collected and the survey data was analyzed and interpreted by using descriptive statistics And, the qualitative data obtained through key informant interview, field observation etc were analysed by narrative analysis. The quantitative data was analyzed by using percentage, ratio, tables, maps, figures and Spatial Data collection and analysis (GIS).

3.7 Spataial Data collection and analysis (GIS)

I used the land use maps pertaining of three years i.e.2001.2013 and 2020 different periods were used for post classification comparison, which facilitated the estimation of changes in the land use category and dynamism with the changes. Data Source:

Geo-eye (2020) Very Resolution Imagery from Google Earth Pro (1m resolution)

Spot 5 (2013) High resolution Imagery from Google Earth Pro (5m resolution)

Spot 5 (2001) High resolution Imagery from Google Earth Pro (5m resolution)

Generation of Land use/Land cover map

Lu/Lc classes: **Waterbody** (Pond, river), **woodland** (Forest, bushland, woodland), **grassland** (grasses mixed with some shrubs), **bare land** (areas with no vegetation, settlement, cultivation), **cropland** (dominantly areas cleared for large-scale farms, irrigated land and mosaic of small holder farms), rural settlement(refugee camps, small villages), rural town (Itang Town).

Forest - areas covered by dense vegetation of trees mixed with grass and shrubs.

Cropland - areas with mosaic of small farmland, large farms, etc.

Rural settlement - cluster of houses(tukuls) mixed with roads like structures.

Data acquisition- Google Earth Pro is used which deliver images at very high spatial resolution (1m) for the 2020, 5meter spot imagery for 2013 and 10 meter spot imagery for 2000.

Very high-resolution imagery and some GPS points (collected in the field from each lu/lc classes) were used to assess the accuracy the classification based on Kappa Index of agreement and confusion matrix.

Visual Interpretation is used to classify the area into the different lulc categories and was applied to classify the images into Lu/Lc classes listed above using Arc GIS ver 17.

Excel was used to generate summary tables, graphs etc. and consists of accuracy assessment worksheet .

Unit Four

Results and Discussion

4.1. Demographic profile of Respondents

The demographic profile of surveyed respondents given in Table 1. distribution of the total number of sample population involved in this study are 95, of which 72 (76%) were males, while 23 (24%) were females. As far as disciplines, 53 (50%) were refugee, 30 (32%) were host communities and 12 (18%) were managers, supervisors, expertise and Professionals..About 22% of respondents were between 18 to 25 years old, 45% of them were aged in the range of 26 and 45 years, 33% of them were in the range of 46 and 70 years old. It will be noticed that the highest percentage of respondents in the research were grouped in middle age (26–45 years of age), this reflecting a greater interest of this age group towards concern of resources and environment. In adaptation to this, the investigation studied 12 officials/chiefs with number of long stretches of working extending between at least five to sixteen. Their respective organizations have also been operating for five to sixteen or more years.

Table 1. Profile of Research Respondents

<i>Profile of Respondents</i>	<i>Frequency/ No. of samples</i>	<i>Percentage (%)</i>
<i>Gender:</i>		
<i>Male</i>	72	76%
<i>Female</i>	23	24%
<i>Socio-economic state</i>		
<i>Refugees</i>	53	50%
<i>Host community</i>	30	32%
<i>Expertise/professionals/</i>	12	18%
<i>Educational back ground</i>		
<i>Phd</i>	1	1.0
<i>Second degree</i>	4	4.2
<i>First degree</i>	7	7.4
<i>Grade 9-12(high school)</i>	25	26.3
<i>Grade 4-8(Elimentary school)</i>	58	61.1
<i>Age</i>		
<i>18-25 year</i>	21	22%
<i>26-45</i>	43	45%
<i>46-70</i>	31	33%

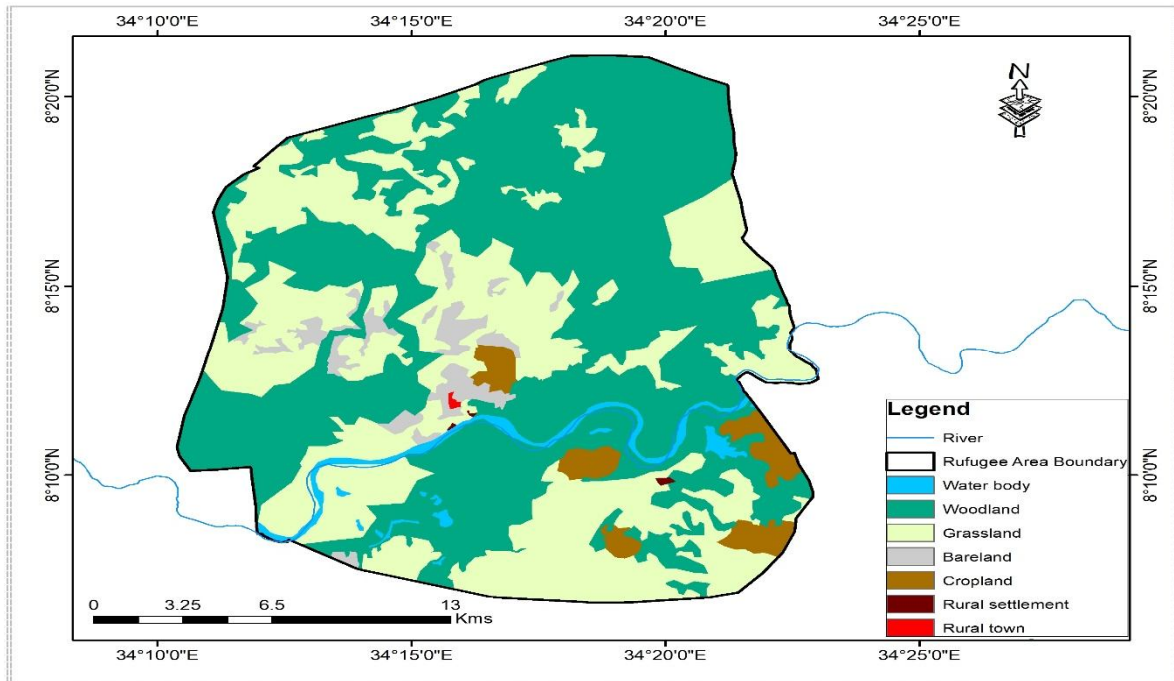
Source collected 2019

4.2 Major environmental problems of the area and drivers of the problem

4.2.1 State of the problem: deforestation, land use and land cover change, water deterioration.

The land use and land cover of the area are identified as : waterbody (Pond, river), woodland (Forest, bushland, woodland), grassland (grasses mixed with some shrubs), bare land (areas with no vegetation, settlement, cultivation), cropland (dominantly areas cleared for large-scale farms, irrigated land and mosaic of small holder farms), rural settlement(refugee camps, small villages), rural town (Itang Town).(figure 5-7)

Fig 5: Lu/Lc Map of Tierkidi Refugee Camp and the Surrounding Area in 2001



Source: Spot 5 (2001) High resolution Imagery from Google Earth Pro (5m resolution)

The tree species that identified in and around the Tierkidi refugee camp are include. *Acacia*, *Grewia*, *mollisis*, *Crateva*, *adansonii*, *Diospyros abyssinica*, *Terminalia*, *macroptera*, *Balanites*, *aegyptiaca*, *Acaciaseyal*, *Olyral*, *atifoliawas*, *Balanites*, *aegyptiaca*, *Pennisetum*, *polystachion* by shrubs, bushes and small trees *Arundo donax*, *Pennisetum isetum petiolare* and other indigenous trees

The 2005 UNHCR Environmental Guidelines state that “uninformed decisions concerning the siting of a refugee camp in, or near, a fragile or internationally protected area could result in irreversible – local and distant – impacts on the environment. Likewise, it is not advisable to establish a camp or settlement close to a dense, a village forest reserve or similarly important natural resources” (UNHCR, 2005:16). But at the time of my research, I observed that three camps in Itang District were located within a forest area and the distance between each other is less than 15 km.

Remot sensenig(GIS) data of around tierkidi camp(15 km radius from the camp) from 2001 and 2013 were investigated as for land cover changes. This investigation showed there was a slight decrease of woodland from 26,025 ha(55.3%) to 25,175 h to (53.5% which was reduced by 850 ha (3.3) and also, the study indicated that there was decreasing in Waterbody from 888ha (1.9 %) to 790 ha (1.7%) which was reduced by 98 ha (11.1); Grassland decreases from 17113ha(36.4%) to 13808(29.4) which was reduced by 3305 ha (19.3) Bare land decreases from 1484(3.2) to 590(1.3)which was reduced by 893 ha (60.2) However, cropland, rural settlement, and rural towns were increased by 5010 ha (342.1%), 104 (373.2%), and 32(149.1%)respectively. within 12 years. Generally, there was a slight decreasing of woodland (Forest, bushland, woodland) , Waterbody (Pond, river) , grassland (grasses mixed with some shrubs), bare land (areas with no vegetation, settlement, cultivation), while cropland (dominantly areas cleared for large-scale farms, irrigated land and mosaic of smallholder farms), rural settlement(refugee camps, small villages), rural town (Itang Town)was increased in the expense of wood land, water body, grass land and bare land, mainly because of the arrival of refugee in and around Tierkidi refugee camp.

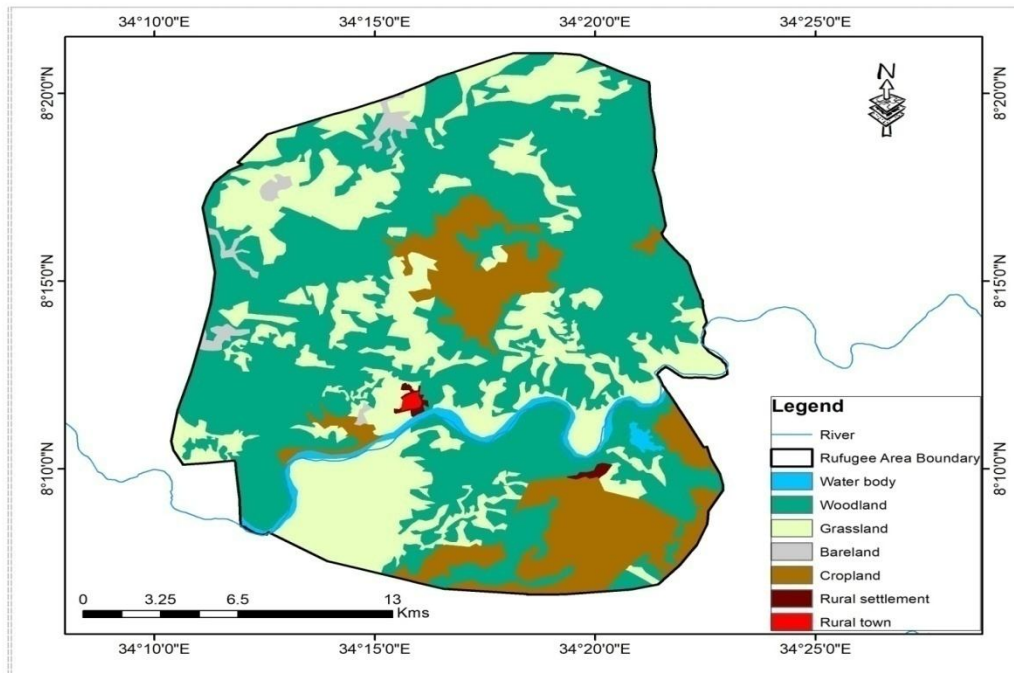
Table 2 Percentages of Land use/Land cover in and around Tierkidi Refugee Camp, , during the period 2001 - 2013

Lu/Lc type	2001		2013		Change 2001-2013	
	Ha.	%	Ha.	%	Ha.	%
Waterbody	888	1.9	790	1.7	-98	-11.1
Woodland	26025	55.3	25175	53.5	-850	-3.3
Grassland	17113	36.4	13808	29.4	-3305	-19.3
Bareland	1484	3.2	590	1.3	-893	-60.2
Cropland	1465	3.1	6475	13.8	5010	342.1
Rural Settlement	28	0.1	132	0.3	104	373.2
Rural Town	21	0.0	53	0.1	32	149.1
Total 1986	47023	100	47023	100	0	0.0

Source: visual interpreted by using Arc GIS ver 17/calculated 2020

The rate of changes in land use and land cover classes of woodland between the years 2001 and 2013(for 12 years) had been reduced by an annual rate of about 70.8 ha/year which was 0.3% lost each year; water body annual loss between2001 and 2013 continued to decline at a rate of 8.2 ha/year (0.9 %); grassland annual loss between2001 and 2013 continued to decline at a rate of 275.4ha/year (1.6%) and bare land annual loss between2001 and 2013 continued to decline at a rate of 74.4 ha/year (5.0 %). On the other hand, the total increment of crop land 417.5 ha/year and its annual increment was 28.5%; Rural Settlement 8.7 ha/year and its annual increment was 31.1% and rural town 2.7 ha/year and its annual increment was 12.4% in and around Tierkidi refugee camp (see table 2 above)

Fig 6: Lu/Lc Map of Tierkidi Refugee Camp and the Surrounding Area in 2013

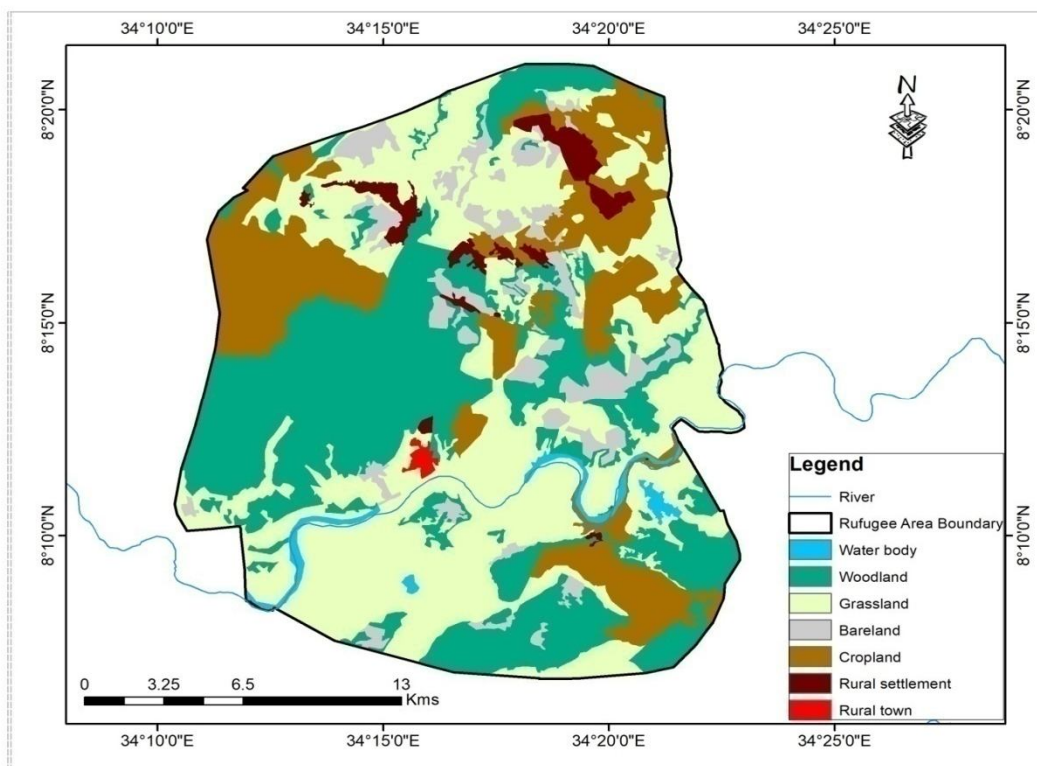


Source: Spot 5 (2013) High resolution Imagery from Google Earth Pro (5m resolution)

Deforestation and depletion of forest resources is the most oft-cited environmental problem in and around Tierkidi camp. Displaced people and the host community must venture out a lot of more prominent distances to discover firewood and wood for construction than was important 5 years back. Be that as it may, as opposed to going these far distances to discover dead wood, a few people have decided to wrongfully chop down living trees, in this way further adding to the degradation.¹

¹Interview on 07 March 2016, at 4:15pm;

Fig 7: Lu/Lc Map of Tierkidi Refugee Camp and the Surrounding Area in 2020



Source: Geo-eye (2020) Very Resolution Imagery from Google Earth Pro (1m resolution)

Aerial photos of around Tierkidi camp (15 km radius from the camp) from 2013 and 2020 were investigated as for land cover changes. This investigation showed there was a remarkable decrease of woodland from 53.5% to 32.8% which was reduced by (-38.7)9730.7ha (12.03%) from 2013 to 2020 i.e. and also, the study indicated that there was decreasing in Waterbody from 789.9ha (1.7%) to 634.8ha (1.3%) within 7 years. Generally, there was decreasing of woodland (Forest, bushland, woodland) and Waterbody (Pond, river) while grassland (grasses mixed with some shrubs), bare land (areas with no vegetation, settlement, cultivation), cropland (dominantly areas cleared for large-scale farms, irrigated land and mosaic of smallholder farms), rural settlement (refugee camps, small villages), rural town (Itang Town) was increased. Between 2013 and 2020, there was decreasing woodland (Forest, bushland, woodland) (from 25174.5ha to 15443.9ha which was -9730.7 ha (38.7%) in the previous 7 years. There was also a reduction of Waterbody from 789.9ha to 634.8ha by (-155.1ha) 19.6%. However, grassland, bare land, and cropland, rural settlement, and rural towns were increased by 30.3%, 459.4%, 29.1%, 790.5%, and

129.1% respectively. Therefore, woodland (Forest, bushland, woodland) and Waterbody (Pond, river) portion of the study area was converted to grassland, bare land, cropland, rural towns and settlements within 7 years due to anthropogenic factors such as an influx of refugees, overgrazing, construction and fuel wood finding to some extent expansion of agriculture. and a small change in the water body which was 6.01ha. The result indicated that almost 9730.7ha area of the forest has gone away in the last 7 years (between 2013-2020) which was about 38.7% lost. The other land use has decreased as the water body that is decreased by 155.1ha (19.6%). In principle, the LU/LC decreased at a certain time has to go to other LU/LC and results from the increment of other LU/LC. Therefore, on the contrary grassland, bare land and cropland, rural settlement, and rural towns were increased by 30.3%, 459.4%, 29.1%, 790.5%, and 129.1% respectively at the expense of the woodland and water body, between 2013 to 2020.

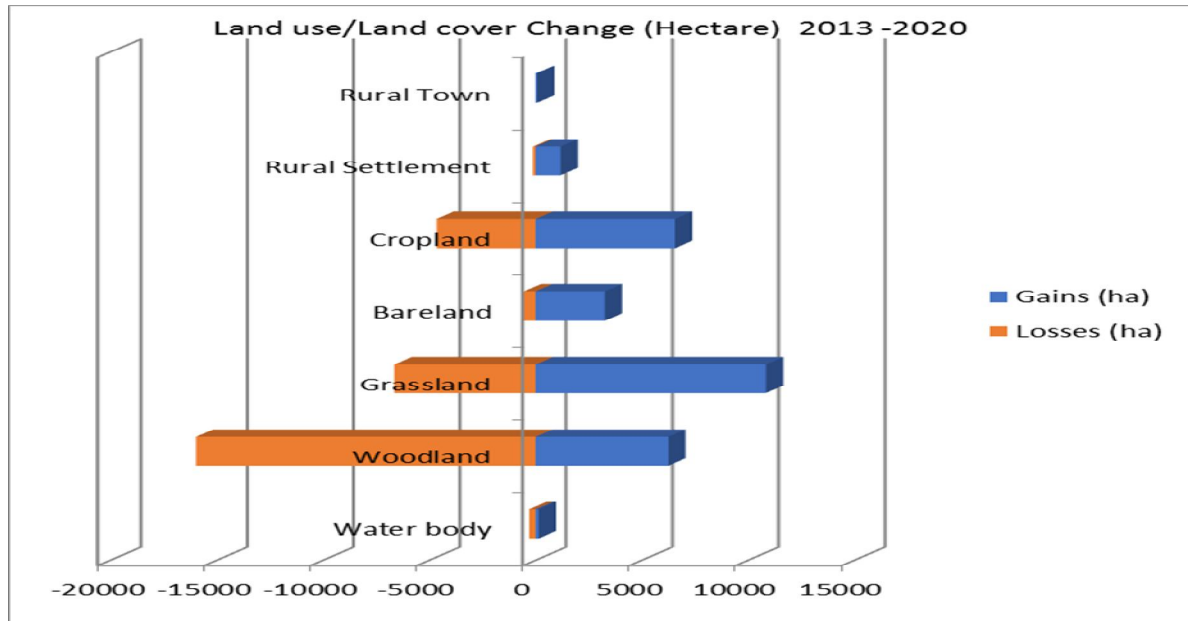
The rate of changes in land use and land cover classes of wood land between the years 2013 and 2020 had been reduced rapidly by an annual rate of about 1,390.1 ha/year which was 5.53% lost each year and the water body annual loss between 2013 and 2020 continued to decline at a rate of 22.16 ha/year (2.8 %). On the other hand, the total increment of grass land was 597.46 ha/year and its annual increment was 4.33%; bare land 387.36 ha/year and its annual increment was 5.63%; crop land 268.8 ha/year and its annual increment was 4.16%; Rural Settlement 148.81 ha/year and its annual increment was 119.93 % and rural town 9.81 ha/year and its annual increment was 18.44% in and around Tierkidi refugee camp . Generally, the exploitation forest and woodland are high then result in converting forest land and woodland into grassland, bare land, and shrubland. In the study area the land use land cover change indicated that unless a good management plan is implemented the woodland (Forest, bushland, woodland) and Waterbody (Pond, river) inland around the Tierkidi refugee camp is still declining. (see table 3 and Figure 8 below)

Table 3 Percentages of Land use/Land cover in and around Tierkidi Refugee Camp, during the period 2013 – 2020

Lu/Lc type	2013		2020		Change 2013-2020	
	Ha.	%	Ha.	%	Ha.	%
Waterbody	789.9	1.7	634.8	1.3	-155.1	-19.6
Woodland	25174.5	53.5	15443.9	32.8	9730.7	-38.7
Grassland	13808.3	29.4	17990.5	38.3	4182.2	30.3
Bareland	590.3	1.3	3301.8	7.0	2711.5	459.4
Cropland	6474.9	13.8	8356.5	17.8	1881.6	29.1
Rural Settlement	131.8	0.3	1173.5	2.5	1041.7	790.5
Rural Town	53.3	0.1	122.0	0.3	68.7	129.1
Total 1986	47023	100.0	47023	100.0	0.0	0.0

Source: visual interpreted by using Arc GIS ver 17/calculated 2020

Fig 8– land use /land cover change (Hectare)2013-2020



Source: visual interpreted by using Arc GIS ver 17/calculated, 2020

4.2.2 Environmental Impacts of Refugees in and around Tierkidi refugee camp

Displaced person floods increase ecological problems – those related with over-misuse of natural resources due to poverty, rising populaces, feeble property rights and wrong administration (mis management). “The presence of large influxes of refugees has also been associated with environmental impacts on land, water, natural resources and slum growth. Environmental impacts are closely associated with the type of refugee settlements and particularly the concentration of people in large camps. The most evident environmental impacts include: (i) deforestation and firewood depletion, (ii) land degradation, (iii) unsustainable groundwater extraction, and (iv) water pollution. In addition, human waste disposal by displaced persons can contaminate local groundwater and cause the spread of diseases” (UNEP, 2005:2).

I first asked the respondents to talk about the natural environment and mention any changes that have occurred over time. Likewise, I asked directly about environment-related problems, although I did not refer to or mention refugees or refugee camps, in order to get a better understanding of what environmental problems really do exist, and whether some of them may be unrelated to the presence of the refugees. A portion of the appropriate responses were unsurprising, as the issues are evidently noticeable, but at the same time are more than once referenced by environmental NGOs and the District Natural Resources Office about the environmental degradation in and around tierkidi refugees camp. Answers included deforestation, soil disintegration(erosion) and depletion of water resource. Another issue referenced was the nearness of forest(bush) fires, which are regularly set by ranchers to clear and treat their fields, however, which here and there wear out of control and wind up consuming a lot of bigger areas than should be expected. Notwithstanding deforestation, all in all, the illicit poaching of woods resources (trees and wild animals) in the forest area was accounted for as another huge problem. In any event, when the displaced people were the immediate reason for the natural resource problems, the host communities were still in a roundabout way capable, as it was the refugee who mainly affected the villagers.² For another person's, in light of the general accord that the displaced persons were the reason for all environmental related problems in the area. While some host communities have added to the degradation, the issues have deteriorated

²Interview on, 06 April 2020, at 11:25am

since the happening to the refugees.³One-woman respondent from host community. The displaced people in Tierkidi camp of Gambella district, natural resource, for example, land, woods, and wildlife has now a lot scarcer than previously and she censured the refugees for this circumstance. She additionally griped about refugees taking their harvests, water, and ruining their customary grazing grounds.⁴ A similar issue was raised and clarified by the numerous nearby host community during the interview and quaternaries response this way: Our woodlands are profoundly exhausted because of risen camp, our land were changed over into refugee camp, family unit utilization and refugees high competition with our local communities for the scarce resource, for example, land, occupations, and environmental resources.

Numerous nearby individuals are brought domestic animals that brushed close to the refugee camp, this adding the problems of overgrazing and acceleration of soil erosion in the area. The abrupt change to the human condition additionally profoundly affected the local wildlife. Hunting had long been an important economic activity for the host community in and around tierkidi camp in particular and the Gambella region of Ethiopia in general and in and around tierkidi camp in particular. In any case, After the area settled by displaced people onwards, hunting as economic activity is diminishing because of excessive hunting practice by a refugee. The rich abundance of the region wild life was almost exhausted and the Anuak lost their primary source of dietary meat.⁵

As most of the local community clarified, the presence of South Sudanese refugees influenced the characteristic resource of the region, for example, land, fuel, water, nourishment(food), and sanctuary materials and considered the refugee as extras their property for disintegration and diminished their dirt ripeness. Their production profoundly weakened due to the expanded land snatching from the host communities with the purpose of a displaced person camp. According to the information gathered from the local farmers, since most of refugees relied on firewood for cooking, the cutting of trees had intensified causing deforestation. As information I heard from the area, cutting of trees long before the arrival of the refugees to the study area. The deforestation and abuse of water resource is really brought about by the increasing populace of residents and their unreasonable cultivating and tree collecting activities. This shows they ought

³Interview on, 23 march 2020at 11:25am.

⁴Interview on, 23 march 2020at, at 14:25am

⁵Interview on, 23 march 2020, at 12: 25am

not absolutely reprimand the displaced people for the circumstance of deforestation in the community.⁶ A key observation during my field visit on 25 March 2020 at 16:45am in the refugee camp is that, shelter service coverage stays insufficient. Furthermore, I saw several charcoal sellers in small market near tierkidi camp. This additionally affects nature, as displaced persons cut indigenous trees to build and keep up their homes and producing charcoals.

what is generally significant for my research, is that the Government of Ethiopia is on record as saying that the refugees have made endless ecological harm to the nation, annihilating water sources and natural vegetation inside and around the camps. Various autonomous (non-government affiliated) reports affirm this case. Despite the genuinely biased and probably exaggerated remarks or blaming refugees as the principal purpose of environmental degradation in study area, by using federal and local authorities officers, nearly all respondents from participants of host communities agreed with the refugees are the most important (if not the only) motive of the seen environmental degradation and resource depletion in the refugee affected regions. In the midst of these on the whole bad environmental adjustments affecting in and around tierkidi refugee camp, we can effortlessly expect that the lives of people in host communities and refugees themselves have been impacted via these changes.⁷“It has become clear that refugee-related environmental impacts can have serious negative implications for the health and well-being of the local population as well as that of the refugees” (UNHCR: 1996:1).

The survey sought residents view on the extent to which eight viable motives of environmental problems certainly make contributions to the problem in and around Tierkidi refugee camp. All seven viable motives of environmental problems have been perceived by using a very giant share of the respondents that make a contribution a remarkable deal or a fair quantity to the environmental problems in the Tierkidi refugee camp (see Table 4 below) Very few respondents said ‘Not at all’. However, poor governmental and non-governmental including UNHCR systems on enforcement of laws, over population(too much refugee) and services such as waste management were regarded most frequently as contributing a great deal to the environmental problems in the camp, followed by a contributing factor that the environment is not a priority for the government.

⁶Interview on, 07 April 2020, at 14:25am

⁷Interview on 07April 2020, at 10:15pm;

Table 4. Community views on causes/driving forces/ contributing to environmental problems(degradation) in and around Tierkidi Refugee camp

Causes /driving forces/contributing to environmental degradations	A great deal (%)	A fair amount (%)	Not very much (%)	Not at all (%)
Overpopulation – too many refugee and host community using up resources unwisely	54.4	35	5.8	4.9
Lack of awareness and education – refugees and host communities just do not know what to do to protect the environment and how to use the resources wisely.	53.5	36.3	8.9	1.0
Lack of enforcement of existing legislations	53.3	30.1	11.7	2.9
Lack of alternative sources of ‘livelihood’ for host community and refugees	34	39	20	7.0
Governmental and non-governmental agencies do not place enough emphasis on protecting the environment (lack of top management’s commitment)	45	39	10	6.0
Governmental and non-governmental services such as budget for environmental management practices and waste management is very inefficient and very small.	59	30	18	3.0
Refugees and host communities are allowed to and pollute the environment	50.5	28.7	11.9	8.9

Source: collected 2019

Given the review and the outcomes portrayed in the previous section, it appears to be sensible to state that this overview is dependable for speculation to the entire tierkidi refugee camp. The outcomes spoke to just what the respondents have said and it very well may be viewed as satisfactory and suitable with regards to tierkidi refugee camp. The study distinguished displaced people and their ability own arrangement of environmental issues and needs that can be considered for arranging and dynamic towards managing maintainable improvement challenges going up against in and around the camp. The general absence of environmental awareness that appeared by the review results is an impression of the disappointment of the current resource and environmental management strategies to incorporate local activities and the absence of a setup instrument for successful network discussion and cooperation in important resources and environmental initiatives. A higher number of respondents saying they were concerned both a great deal and a fair amount about environmental problems, shows an overall indication that there is quite a high degree of interest and concern about environmental problems in the camp. Therefore, the importance of the environment is likely to increase in the future as an issue for

government attention besides the priorities of education, health-related infrastructure and unemployment. Almost all of the respondents stated that they had made some changes in their knowledge and behavior for environmental reasons during the past years show a high level of concern. Further, environmental regulations were seen as being generally too lax in all of the sectors covered in the survey. Surveyed residents did not regard all likely sources of environmental information as equally reliable. Governmental and non-governmental institutions, local media, and schools were seen as very important sources of information saying either very reliable or fairly reliable of environmental information. This view indicates that residents have easy access to information provided by these organizations. As expected, respondents stated that the most important environmental initiative for governmental and non-governmental action over the next few years should be their attention to addressing environmental problems. At the same time, respondents would like to see more effective and sustained awareness and education programs on environmental issues for the refugee and host community specially to deal with waste management problems.

4.2.3 The impact of environmental deterioration on refugees and refugee-affected populations.

Environmental degradation impacts the lives of displaced people and host communities in various manners, further expanding its challenges. Deforestation close to the camps is the clearest case of environmental degradation. Refugees regularly needs firewood at a rate that the environment can't renew, causing the displaced people, frequently women and children, to look progressively further away, putting them at an expanded danger of the violent attack. Proceeded with abuse of resources, paying little heed to the crises, is impractical and can just prompt more battle. Reaction to the request on whether the study community apparently degraded environment as an issue in their surrounding area indicated that on average 79% of the respondents considered environmental degradation as being a serious problem in their vicinities and results different impacts on them such as increased workload and vulnerability, especially for women and children. For screech/collect/ of water and firewood (90 %). Worsening education levels, for example, children are too sick to attend school, or are needed more at home, e.g. to collect water and firewood, carry out agricultural work or care for sick family members (85%). Increased violence and social unrest, e.g. due to conflicts over firewood and other natural resources between refugee and host community (82%). Increased risks of mismanagement of

wastes, particularly solid waste (79%). Poverty and increased vulnerabilities due to failure of agricultural livelihoods and food shortages and high goods prices, especially for host community (75%). Less availability and quality of water and food supply lead to malnutrition, sickness and famine (73%) and Shortage of energy particularly fire wood (70%). (see table 5 below) Day to day conditions inside the camps is frequently characterized by scarce resources, which cause the villagers to rely upon the environment in manners they typically would not protect. Normally, environmental degradation is set aside while displaced people deal with health and education deficiencies despite the fact that these helpful concerns are unpredictably connected to environmental ones. The removal of Forest in and around tierkidi refugee camp, for use as firewood and to clear spaces for houses and different purposes, has prompted critical environmental degradation. This has exposed communities to different negative impacts such as livelihood is being lost.

Water and firewood supplies are influenced, affecting individuals' wellbeing and makes life too costly in this way results in an insecure environment or low (week) environmental security in the study area. It is understandable that bunches from the international community center around the more visible suffering of the displaced people yet they ought not to disregard this degraded ecological effect on refugees and host communities. The environmental degradation of the area in and around tierkidi refugees camp directly adds to affliction and savagery that happens to those living in and around camps. For example, 82 % of respondents believed degraded environment has increased violence and social unrest, e.g. due to conflicts over firewood, water and other natural resources between refugee and host community and some time there is also conflict between refugees themselves because of scarce natural resource.

The effect of environmental weakening on the refugees themselves and host communities is extraordinary. Low-quality water influences the health of large number of individuals, in a circumstance where there is a high danger of infectious diseases duplicating quickly. Deforestation bit by bit forced women and children to walk more for wood, placing women specifically at risk for the physical ambush. Children may need to miss school to help their families; cooking time is abbreviated, and drinking water scarcity. Refugees may need to sell some portion of their food apportions so as to get the fuel expected to cook the rest of, contributing to increased levels of malnutrition. Host community alone additionally experience a comparable decay in the quality of their environment, with the goal that regularly accessible

materials and supplies for construction, utilization and fuel are short, and costs for fuel and food in local markets rise. Tension definitely result, since host populations are currently made to bear many of the costs of the arrival of refugees in their area without immediate compensation. Regarding to this 75% of respondents believes that degraded environment affected them by increasing Poverty and expanded vulnerabilities because of the failure of farming, livelihood ,food deficiencies and high good prices, particularly for have a host community. Intensifying or highly Vulnerable individuals in the study area are, with lower capacity to with stand environmental negative impacts, will be in a more fragile situation than those with more grounded abilities to withstand the entirety of the effects of a degraded environment. People generally most vulnerable to the effects of a degraded environment are for the most part: – women including widows and pregnant women ,children’s including orphans, older people, people with disabilities, people living with HIV and AIDS ,people who are ill , people who are poor, people who are disenfranchised, people who are oppressed and/or in abusive relationships.

Table 5 Impacts of degraded environment on host community and refugee in percent in and around Tierkidi camp

Impacts of degraded environment on host communities and refugees in and around tierkidi refugee camp.	Responses of respondents in %
Increased workload and vulnerability, especially for women and children. For screech/collect/ of water and firewood.	90%
Worsening education levels, for example, children are too sick to attend school, or are needed more at home, e.g. to collect water and firewood, carry out agricultural work or care for sick family members.	85%
Increased violence and social unrest, e.g. due to conflicts over water and other natural resources between refugee and host community.	82%
Increased risks of mismanagement of wastes, particularly solid waste	79%
Poverty and increased vulnerabilities due to failure of agricultural livelihoods and food shortages and high goods prices, especially for host community.	75%
Less availability and quality of water and food supply lead to malnutrition, sickness and famine.	73%
Shortage of energy particularly fire wood.	70%

Source.survey, 2019

4.3. Nature, processes and extent of UNHCR environmental management

4.3.1 Initiation and programs of environmental management by UNHCR in

Tierkidi camp.

Environmental contemplation should be considered in practically all parts of UNHCR's work with refugees and returnees. Despite the fact that UNHCR has several environmental mitigation programs which are mentioned on its environmental guidelines (1996 and 2015), it has applied only a few mitigation measures or environmental mitigation programs in the study area including reforestation, distribution of improved stoves, environmental awareness creation, building terracing, deploying forest guards and construction of firebreaks to protect the existing forest.

Environmental activities in Tierkidi camp is executed by the Energy and Environment Working Group (EEWG) comprised of UNHCR, ARRA, and the partners including the regional environment office engaged in environmental protection activities. The refugees do have also a Refugee council (RC) with the sub-section of environmental protection. The main duty of both the EEWG and refugee council (RC) is to monitor and report each and every environmental intervention and protection activities obeying accordingly the guiding principles. Under UNHCR coordination and subsidizing, the International Committee of the Red Cross (ICRC), NRDEP, ZOA All offices are required to work as a team with the Ethiopian government's (ARRA) and their staff from federal to the district level.

Not many administration duties have been appointed to host community establishments, in huge part due to their non-presence or lack of capacity. Planting trees and promoting energy-efficient stoves are two of the most widely recognized environmental mitigation measures in and around tierkidi refugee camp, one reason for this is on the environmental projects in displaced person tasks that are regularly observed as straightforward supply and demand activities. The supply of wood is expanded through tree planting and its pace of utilization diminished by promoting improved cooking stoves.⁸

The main components of environmental protection activities in and around tierkidi refugee camp are reforestation, distribution of improved stoves, environmental awareness creation, and protection of standing trees.

⁸Interview on, 07 February, 2020 at 14:25am

4.3.2. UNHCR Environmental protection and mitigation practices in Tierkidi refugee camp.

4.3.2.1 Access to Energy

“At the Sustainable Development Goals (SDGs) Framework launched by the UN in 2015, the Goal 7 aims at “ensuring access to affordable, reliable, sustainable and modern energy for all” (United Nations General Assembly 2015:14). “Likewise, refugees should be included in this worldwide commitment. However, almost 90% of people living in refugee camps do not have access to electricity. In order to change this situation, the UNHCR launched the Safe Access to Fuel and Energy (SAFE) campaign in 2013, a global strategy to solve this problem.” (Alianza, 2017:5)

At refugee camps, there are energy needs at households, production, and community levels. In family units, energy is required for cooking, warming, and lighting. The beneficial employments of energy can run from charging a cell phone to giving lighting or utilizing an electrical device in small businesses. Regarding communal use, energy is required for the arrangement of essential services, for example, training, sanitation, water supply, or health. These communal services cover the essential needs of a high number of clients with moderate energy demand. Energy is very important. You can't live without energy, a lady in the camp can be ill and she can't go to the clinic in the night time due to the fact she can be raped.

There is no mild so you are scared to go away the house. When ladies go to get firewood, they will be raped. It takes place a lot. The younger ladies will on occasion promote our bodies for firewood due to the fact they can't go away their kiddies to go discover it. moreover, without light, refugees can't stroll round safely in the night time and are extra possibly to be uncovered to security dangers such as sexual and gender-based violence. The lack of a sustainable supply of electricity additionally effects in female spending hours looking for firewood rather of enticing in livelihood, educational, social, and different activities. Children who accompany their moms can't attend school. Additionally, the use of already scarce resources can result in environmental degradation and tensions between refugees, internally displaced persons, and host communities.⁹

UNHCR has been engaged to supply stoves mainly to refugees and a small portion to the host community in and around tierkidi refugee camp since the camp was established. According to

⁹08 April 2020, at 10:15-12:30pm

ARRA Gambella branch office, UNHCR and its partners distributed only small number of improved stoves for communities living in and around tierkidi refugee camp, that is 5500 stoves for refugees and around 700 stoves for host communities. There isn't such a great amount of power in the study area. A few people have power and generators, perhaps about 7-10% of the households. The rest can have little solar lights however others need to cook at 4 pm in light of the fact that after there is no light thus, they need to utilize candles. A few people can't even afford to have a torch light. She added in tierkidi camp, the main energy sources for cooking are fuelwood and charcoal, while other fuels such as ethanol and kerosene are very small. Regarding the most common cooking stoves in Tierkidi camp are, I remember there was a quick survey to know the types of energy use in the Tierkidi refugee camp before six months ago, according to this a quick mission assessment of the majority of refugee households in Tierkidi camp. still use the traditional three-stone fire cooking system.¹⁰

Regarding numbers of stoves that households used today, no much is known since an assessment has been done. However, a quick mission assessment revealed that the majority of refugee households (around 85 % of the total households) still use the traditional three-stone fire cooking system. the stoves have been distributed some time ago, there is no guarantee in the refugees still are using these stoves. Regarding the types of energy access does in and around Tierkidi refugee Camp currently are Pre-fabricated Stoves known as the Ethiopian Rocket stove (Tikikil stove) that is 5,000 (provided during the stove distribution period) The distribution norm is 15% for host communities, so 750 (15% of 5,000) might have been distributed for host communities. The same type of stove mentioned above. Furthermore, regarding Alternative Energy, the refugees may collect grass and plant residues for cooking fuel, however, UNHCR doesn't have provided these.¹¹

“According to a UNHCR survey, the vast majority of refugees in the camps in Chad, Ethiopia, Kenya, and Uganda rely on wood for cooking. They spend an average of 31 hours a month on firewood collection. Thirty percent of these refugees reported coming into conflict with the host community, as a result of these activities” (UNHCR,2015:16). This is also true or applicable in and around Tierkidi refugee camp that is according to a quick mission assessment to know what

¹⁰Interview on 08 March 2016, at 10:15-12:30 pm

¹¹Interview on, 07 February, 2020, at 14:25 am

kind of energy source used by refugee household in the study area, the survey revealed that the majority of refugee households (around 85 % the total households) still use the traditional three-stone fire cooking system. Although UNHCR and its partners supplied improved stove to the refugee and host community to protect the environment from degradation and mitigation already degraded environment. It is very insufficient compared to the level of the problem in the study area. Access to energy at refugee camps is a complex and wicked problem that cannot be resolved by applying the traditional project /approach through one-time interventions. It requires innovative proposals involving different stakeholders (from the public and private sectors as well as from the civil society) holding special skills (in resources, knowledge, experience) in order to provide an adequate, integrated, and sustainable response in and around Tierkidi refugee camp.

Fig.9.The picture depicts the refugee ‘s shelter and traditional three stone fire using firewood for most commonly used for cooking.



(A photo captured by the researcher during field work, 11 February 2020).

4.3.2.2. Accesses to Water

Refugees water gracefully frameworks are generally important to cover the water needs of refugees living in camps or in town like provincial conditions all through the world. To offer satisfactory support, the framework must be built so that every one of its parts are suitable, good with one another and as per the creation limit of the water sources and the water request at the camp at some random time. The prerequisites for the activity and support of this framework

should be to such an extent that they will consistently be effectively met with locally accessible assets and at the most minimal conceivable expense. The supply safe drinking water is a crucial element of the response to a situation of human displacement. People want water to fulfil a quantity of critical features such as drinking, cooking and private hygiene, as nicely as for cattle and agricultural purposes. Human displacement, however, can have serious environmental influences on water supplies.

Table 6 Water supply and number of household beneficiaries in Tierkidi camp in percent

Years	Share household beneficiaries in percentage
2015	Below 50%
2016	66%
2017	72%
2018	74%
2019	89%

Source collected,2019

According to the ARRA Gambella branch office, UNHCR is fully responsible for the supply of water to refugees and host communities in and around Tierkidi refugee camp. It is cleaned groundwater pumped and supplied by UNHCR with an average supply of 13 liters of water/person/day. Water infrastructure in tierkidi camp after interventions in 2016(66%),2017(72%),2018(74%), and 2019(89%) of households had access to improved cleaned pumped from groundwater sources.

Results in table 6 show a statistically significant increase in year-round access to an improved water from 2015 to2019, increasing from below 50% to 89%. (see table 6 above) This coverage does not mean that, the community is satisfied by water supply by UNHCR because most of the communities including refugee get below the minimum standard i.e. 13 liters of water per person per day.(see table 7 below)

Although UNHCR and its partners supplied clean water for the communities in and around tierkidi refugee camp, its amount is below the standard and does not cover all the community especially the host community .because of this the host community feels they are ignored by UNHCR thus it became the cause of conflict with the refugee.¹² From community and household survey data I found four factors that had potential effects on water intervention sustainability in

¹²Interview on 08 March 2016, at 10:15-12:30 pm

the study area, these are one Occurrence of natural disasters or events e.g. drought, two Population growth, three Presence of active water committee and four follow-up from concerned organizations “Water provisioning facilities need to be carefully planned and closely monitored. As a minimum standard, each person should receive at least 15 liters of water per day” (UNEP,2006:79). but most of refugee camps in developing countries are not received a reliable supply of water. For example, the states of supply of water for refugee camps in Ethiopia is as follows “12.5 million liters of water were supplied across the regions in Ethiopia hosting refugees, with eight of the 26 refugee camps meeting the minimum standard of 20 liters of water per person per day (lppd). 11 camps are between 15 and 20 lppd while seven camps are still below the 15 lppd threshold. 19 of the 26 refugee camps have met the minimum standard of ‘maximum of 20 persons per latrine’ while eight camps are still below the minimum standards” (UNHCR,2019 :2). Tierkidi refugee camp is one of the camps that does not meet the minimum standard i.e. Below the 15 lppd threshold.It is fundamental to guarantee that current water sources such as springs are shielded from:Livestock,latrines, which should ideally be placed at a 30m distance and downstream,clothes washing and bathing areas,burial grounds and waste disposal sites.

UNHCR and its partners have been considered various water-related measures that ought to be taken to maintain a strategic distance from environmental harm in and around Tierkidi refugee camp. Securing common springs is basic to guarantee that dependable supplies of water can keep on being accessible. Without a doubt, preventing contamination is one of the fundamental difficulties all over the duration of a camp. Contamination of water resources can be brought about by a blend of activities, for example, human settlements being found excessively near open streams or over unconfined springs; poor siting and construction of restrooms, and so on. All water and related issues ought to be up to the standard (see table 7 below) of various international governmental organizations and the host governments in the study area

Table 7. Minimum daily requirements of water

Sources of water needs	Water manual for refugee situations (UNHCR, 1992)	Communicable disease control in emergencies – A field manual (WHO, 2005)	Handbook for emergency, United Nations High Commissioner for Refugees (UNHCR, 2007)	Minimum requirements: immigrant connect (2010)	Assessment of energy, water and waste reduction options for the proposed AMISOM HQ in Mogadishu, Somalia and the support base in Mombasa, Kenya (UNEP, 2010)	UNHCR (2011)	The sphere projects. Humanitarian charter and minimum standards in disaster response (2013)
Minimum "survival" allocation [litres per person/day]	7		7	7		7	
Minimum allocation [litres per person/day]	15-20		20	20		20	
Hospital [litres per person/day]	220-300						
Health centre [litres per patient in/day]	40-60	50	40-60	40-60		40-60	
Health centre [litres per patient out/day]	5						5
Cholera centre [litres per patient/day]							60-75
Feeding centre [litres per person/day]	20-30	20-30	20-30	20-30		20-30	
Kitchen [litres per person/day]		10			4		
Livestock [litres per animal/day]							20-30
Schools [litres per pupil/day]	2		3	3		3	3
Offices [litres per cubicle/day]			2-8	2-8		2-8	
Hand washing [litres per person/day]			1-2	1-2	8	1-2	1-2
Shower [litres per person/day]					30		
Public toilet (water flushing) [litres per person/day]					28		20-40
Toilet cleaning [litres per person/day]					4.5		

Source (Francesco Piana and Mauro Gamberi; 2015:5)

4.3.2.3. Waste management

When refugee camps are established in emergency conditions, waste disposal has given a very low priority. Field-expedient measures of open dumping, burying, and limited burning of waste are well-known practice. But at once from the early recuperation phase, the waste produced in a camp represents an extraordinary problem. An older, poorly-designed or poorly managed waste disposal can have a variety of damaging effects such as wind-blown litter, the enchantment of vermin, develop of liquid Leachate, however additionally accidents of people, social tension, and more.

Without a suitable waste disposal system and support, refugees are possibly to make use of burning or burying their waste in an uncontrolled manner in and around Tierkidi refugee camp. This is regularly observed to be undertaken on the area of camp and simply outside of tierkidi refugee camp. The expected influences on the environment and on groundwater sources are not often considered, probably ensuing in ponds and rivers with floating waste which provides a nuisance and a factor of air pollution and contamination of shallow wells and water sources.

The way in which waste is gathered and disposed in and around Tierkidi camp can have a predominant impact on the surrounding environment. Left unattended or uncollected, waste rapidly leads to terrible hygiene, attracting vermin, and due to this fact leading to sickness and related health risks. Livestock such as cattle's, goats, as well as wildlife may also suffer from consuming non-organic waste gathering in the camp or surrounding areas. Plastic baggage is in particular destructive as they can kill the domestic animals that consume them. If they accumulate, they can additionally prevent water from penetrating the surface of the ground, leading to the formation of pools of stagnating water that constitute best place for mosquitoes and different insects.

Data on waste generation and waste composition in Tierkidi refugee camp had been extraordinarily limited. According to several studies, the quantity of waste generated in tierkidi camp used to be probably to be quite low, averagely round 0.1 kg/per capita per day. This estimate used to be additionally reinforced via the truth that some kinds of waste (e.g. plastic bottles and tin cans) have been commonly reused or recycled and seldom entered the waste stream. There are a number of kinds of waste produced in Tierkidi refugee camp.

Table 8 kinds of solid wastes produced in and around Tierkidi camp in percent

Waste type	Ratio in percent %
plastic bags and plastic items	65%
kitchen waste and dry grass and leaves	20%
paper and cardboard	10%
market areas& healthcare facilities waste products	4%

Source : survey ,2019

The primary waste kinds produced in the camps covered plastic bags and plastic items (about 65% of the waste), kitchen waste and dry grass and leaves (about 20%), and in a way's smaller portions paper and cardboard (about 10%). Other sources of waste in Tierkidi camp covered the waste produced in market areas and in healthcare facilities (4%). (see table 8 above)

There used to be no uniform collection approach being carried out in the camp; there are variations in storage kind and collection objects dispensed and in the design of facilities.

Bamboo or plastic containers have been the most frequent storage technique at home level and constant series points have been usually used for waste collection. refugees mentioned that, even though the collection point used to be recognized and used by the community, an everyday system of the collection was no longer in place and the collection point used to be not frequently emptied. This system used to be additionally not appropriate for the wet season due to the fact that it was uncovered and rain would percolate into the waste, developing difficulties during the following phases of collection (e.g. corrosion of collection tools and cars and heavyweight of waste).

Waste would be gathered from the 'shelter containers' twice per week with the aid of capacity of handcarts (each of them with three waste workers), which would transfer the waste immediately onto trucks.

“Sustainable waste management can be achieved through waste collection, appropriate dumping, composting or a combination of the above. Proper waste collection requires that waste collection points made of old oil drums or other recycled containers be regularly emptied. The camp management agency, together with the refugees, should provide and manage such collection points for every 10-15 families or for every cluster of shelters in the camp” (UNHCR, 2000:3). The implementation of a programme involving the universal hierarchical methods to waste

management, based totally on the 5 R's (i.e. Reduce, Re-use, Repair, Recycle and Residual management) have to be a predominant characteristic of any waste disposal plan, as it can grant a supply of income whilst decreasing the quantity of substances that may in any other case have to be dumped .although it is not entirely practiced or utilized in Tierkidi camp.

Although I observed from the host community and refugee and I identified in the course of my remark landfills are not set up in an acceptable area in and around Tierkidi refugee camp, gathered non-organic waste ought to be disposed of suitable via dumping in landfills. If there is a threat of groundwater contamination from landfills, an impermeable liner has to be placed underneath the landfill. This can be executed with an impermeable layer of soil, such as clay, or via the use of a membrane. In each case, collection systems have to divert water downstream from the groundwater source. Once the landfill is full it must be protected by means of an impermeable liner to forestall rainwater from coming into it.

Burning have to only be regarded as a secondary alternative and have to be prevented the place possible. As a popular standard, Tierkidi camp ought to have at least one latrine for each and every 20 individuals of the community. Latrines ought to be dug downstream of wells and ought to be at least 30 m from any groundwater supply and at least 1.5 m above the water table. Latrines have to ideally be no greater than 50 m from dwellings as this encourages desirable hygiene. Family latrines are the desired option.

Generally, Camps are regularly placed in faraway areas where little waste treatment infrastructure exists. One must be innovative and seem to be for possibilities to design and function appropriately-scaled systems to deal with waste. waste management and pollution have been recognized as main problems for the duration of Tierkidi refugee camp, especially in relation to solid waste. Therefore, waste disposal and minimization ought to be regarded via enhancing the waste disposal services, investigating possibilities for recycling, enhancing enforcement of current rules and reviewing ancient guidelines to convey greater in line with the contemporary problems and train people on waste minimizing techniques, such as composting, motivate to keeping off plastic baggage from purchasing malls and much less packaging, etc.in Tierkidi refugee camp.

4.3.2.4. Reforestation and protection of trees

A Forest Management Plan can have different targets that ought to be set to sustainably satisfy the need for forest products and services in particular areas, circumstances, and communities. “the four main purposes of management interventions in displacement(refugee) settings are: The natural regeneration or rehabilitation, protection and use of degraded forest land, Plantations for energy (wood fuel), Plantations for timber production; and Plantations for food production.

At present, UNHCR and its partners are engaged with re-afforestation programs. That is in a joint effort with the Government of Ethiopia (relevant government offices, such as ARRA, NRDEP and the regional government in Tierkidi refugee camp, UNHCR have planned a progression of re-afforestation activities, which should, by preference, be community-driven. UNHCR launched the planting program in 2017 in a bid to redress the balance and to heal the land generously provided by the host nation.

The first reforestation program in refugee-affected areas was implemented between 2017 and 2019 for UNHCR by NRDEP, Energy, and Environment Working Group (EEWG) and the regional government in Tierkidi refugee camp i.e. Refugee council (RC), has continued these activities since 2017. generally, The tree planting part is fixated on organization run tree nurseries in the camp which employ displaced people and local individuals to produce seedlings. The tree species raised reflect a blend of agroforestry and woodlot assortments, with a commonness of Eucalyptus, Acacia trees, shade/homestead tree species, Pinus, Black Wattle, mango, Papaya and other Fruits. Seedlings of various types are dispersed openly to displaced person family units for planting on garden plots and cultivated land in and around the Tierkidi refugee camp.

UNHCR and its partners planted a different kind of tress such as Eucalyptus, Acacia trees, shade/homestead tree species, Pinus, Black Wattle, mango, Papaya and other Fruits in 2016(50,000),2017(100,000),2018(150,000) and in 2019(180,000). (see table 9 below)

UNHCR provides materials, seeds, and tools, as well as training and technical advice on agroforestry projects that benefit refugees as well as the local community. Women carry out most of the projects, which combine environmental and self-reliance activities with peace-building. An average of 100,000 multipurpose trees, shade trees, fast-growing trees, indigenous trees (e.g. Acacia trees) and fruit trees such as mango, papaya, etc. has been planted in and

around Tierkidi refugee camp. The nursery produces 100,000-150,000 seedlings a year for fields or home gardens. The project benefits 1,400 locals and 9,000 refugees. The project has assisted both the refugees and host communities, via agroforestry, in the cultivation of vegetables for family consumption and for sale in local markets.¹³ This statement was supported and stated by one female refugee respondents.¹⁴

Table 9 Numbers of trees yearly planted in and around Tierkidi refugee camp

Years	Average number of trees planted
2016	50,000
2017	100,000
2018	150,000
2019	180,000

Source collected,2019

Tree-planting programs often meet with mixed success in camp situations. While planting trees can serve as a useful indicator to visibly reveal that motion is being taken to protect or restore the environment, some simple lessons should be heeded: Plants grown in camp-and village-based nurseries need to replicate the required needs of people living in the area: this necessitates prior consultation with the different stakeholders.

Displaced people may not always see the benefit of planting or caring for trees as their hope is most often to be able to return home, as soon as possible. Planting or caring for trees is also not part of certain cultures. In many instances, however, people appreciate that they can easily grow a few fruit or shade-giving trees around their shelter and that this will provide some positive return. The number of seedlings grown in a nursery is often a negative indicator of success, but one that is widely used for monitoring. The number of trees surviving after two years following planting is a lot more useful. Establishing a woodlot for fast-growing, and ideally indigenous, species can help address shortages of fuelwood and/or construction materials. As with all plantations, however, the issue of ‘who owns the trees’ needs to be determined in advance. It is always preferable to support the planting of native over introduced exotic tree species. A balance may need to be struck in some conditions depending on locals needs.

In addition to the planting of trees, there are Tree protection activities in tierkidi camp: A network of about 8 forest guards in the camp guides refugees to select areas for the collection of

¹³Interview on 08 March 2016, at 10:15-12:30 pm

¹⁴Interview on 24 March 2020, at 10:15-12:30 pm

firewood and constructing poles whilst trying to protect standing trees and bushes and regenerating stumps inside the instant vicinity of the camp. We have been working our activity beginning from 6:00 hours in the morning to 15:00 hours in the evening time. We have not covered all the forest areas, particularly out of the camp since the study area has not very much forest guards when we compare with the size of the forestland. The deforestation was the highest outside of the refugees camp when compared from those inside the camp boundaries, the forest inside the camp boundary are genuinely well watched, basically by camp guards, despite the fact that their essential assignment is to guarantee that the camps are secure, the nearness of the camp watchmen also, another camp staff dissuades individuals from chopping down trees inside the camps, as this is contrary to out sidethe camp. Likewise, on the grounds that the camps are reasonably thickly populated, it is hard to chop down trees. inside the camp boundary without being seen by different displaced people living in the camps who may report criminal behavior. While the poaching is for the most part done by the host community.¹⁵By maintaining trees and bushes, as opposed to cutting them down for seasonal gain, they deliver a sustainable source of fruit, medication, shade, and food. They likewise protect erosion, expansion of desertification in the study area.

Finally, according to the information collated and analyzed, I argued that, UNHCR and its partners' tree planting and tree protecting activities in and around Tierkidi refugee camp has very small coverage and insufficient compared to the amount or scale of forest degradation i.e. cutting trees for fire wood and for building purpose, thus this mitigation activity had not brought or fulfilled its objectives.

¹⁵Interview on 24March 2020, at 9:15-10:30pm

Fig. 10 The picture depicts the nursery site in Tierkidi refugees camp.



(A photo captured by the researcher during field work, 11 February 2020).

4.3.2.5. Environmental Awareness

Awareness-raising is another environmental intervention of UNHCR and its partners in Tierkidi camp. “All environmental mitigation efforts must contain training elements for the participants. This will enable the host community and refugees to play an increasing role in mitigation activities and continue the projects with less outside expertise. Acquired skills are among the most valuable 'portable ' assets refugees can derive out of mitigation projects. For both groups it is essential, that training leads directly to an improvement of their economic situation” (Thomas Hoerz,1995:9).

UNHCR and its partners report various training and awareness-raising initiatives that have occurred in Tierkidi refugee camp. These consist of beneficiary sensitization mission to the fuel-efficient stove’s producers in Tierkidi camp meetings with women's groups, displaced people, host communities, parents, camp leaders, the environment club; and training in the use of the briquettes, fuel-efficient stoves, reforestations activities, sanitation, and proper waste management, and so on.

In and around Tierkidi camp, UNHCR and its partners' environmental training and education were characterized to cover different issues related straight forwardly to the environment, for example, forest management, as well as indirect issues such as sanitation and small-scale agriculture. Environmental training and education included avoidance of uncontrolled bushfires,

re-plantation of forests, improved sanitation, nutrition, health and hygiene as well as conservation farming.¹⁶

We were participated in special environmental education programs; we understand about sustainability, the importance to keep away from bushfires, to keep away from irrational use of natural resources, sanitation, and waste management, alternative energy resources, how to produce and use stoves. We also understanding about the interdependence between the environment and humans. It used to be described that environment as such is extraordinarily vital to people as they would not be in a position to live in the absence of it. It used to be additionally pressured that sanitation and general waste management have been being taught due to its robust function in stopping diseases such as cholera and malaria. Refugee taking part in an interview mentioned, for instance, the following topics they learned; We study no longer to pollute water, no longer to cut the trees and bushes in the absence of plan or planting of trees, no longer to pee on plant life and now not to hunt animals throughout the reproductive period each refugee respondents confirmed that UNHCR and its partners have a training center for the refugees at the Tierkidi camp, where they train environmental awareness such as tree planting, seedling production, and alternative energy use. In addition, locally made mud stoves.¹⁷ refugee in Tierkidi refugee camp received environmental and health related training through different governmental and non-governmental organizations. For example, communities trained about sanitation, toilet building, cleanliness, trained issues related to water, sanitation, and wells, in addition to refugees, the host communities expressed that they trained how to plant trees and about the importance of avoiding bushfires and etc. by different organization, for example, UNHCR, ZOA, and ICRC.. Besides, the association was working with capacity building, training the community forestry management, and disseminates data on hygiene just as waste and water management so as to avoid diseases such as cholera and malaria.

Even though there are numerous environmental awareness rising activities have been taken place in and around Tierkidi camp, there are several challenges concerning environmental training programs the major ones include, most prominently, the lack of budget and finance and the lack of donors for training and education projects. Thus, resulted in a scarcity of manpower

¹⁶Interview on 24 March 2020, at 10:15 pm

¹⁷interviews on 24 March 2020, at 11:15,

and forced UNHCR and its partner's environmental awareness to work in a few topics and very small trainees. Hence, it used to be occasionally described by the respondents that it was tough to tackle environmental awareness problem that have in most of the government officials, NGOs and INGOs expertise, refugees and host communities.¹⁸

While these interventions are commendable, it looks that other possibilities for raising awareness and participatory project/initiative improvement are not being exploited fully, the example of this relates to the truth that whilst UNHCR and its partners have been concerned in participatory activities referring to firewood management, the lack of visibility in the field of such activities suggests that they are limited, or are not being as efficient as intended.

UNHCR and its partner's field workers might also require capability constructing in participatory initiative improvement if the suggestions in this report are to be executed. Participatory firewood management planning, for example, with each refugee and host communities, would make stronger and increase present day initiatives. Community Environmental Management Planning is a solid foundation upon which to advance and improve participatory initiatives.

Overall, the survey outcomes have indicated that even though, UNHCR and its partners engaged in varieties of environmental awareness activities, it did not cover all environmental mitigation programs of UNHCR and all the concerned refugees, host communities and even environmental workers due to the fact of variate of factors like lack of budget and etc., so that there is a need for extra and brooder environmental training and awareness creation projects and activities for concerned individuals and stake holders in and round Tierkidi refugee camp.

4.4. Impacts of UNHCR environment mitigation programmes in and around

Teirkidi refugee camp.

The essential objective of the UNHCR is to give security to displaced people and look for perpetual answers for their issues. Along these lines, the UNHCR's ecological approach likewise intends to secure the establishment of refuge. Since states have likewise been worried about the conceivable natural harm brought about by the outcast inundation, the second objective of the UNHCR is to secure the earth so as to guarantee practical advancement in the host nations.

¹⁸interview on 24 March 2020, at 3:15

UNHCR duties in and around refugee camps include:- to supply safe, well timed and dependable energy throughout refugee emergency operations, to defend refugees from risks, such as sexual and gender-based violence (SGBV), that regularly appear at night time in unlighted areas woman journey far distances from the refugee camp to collect firewood and water ,latrines, washing zones, playgrounds, workshops; to defend refugees from bodily harm such as landslides, floods, and vulnerability to hazardous wastes and toxins in the air, soil or water; to decrease conflicts between refugee and host populations over scarce natural resources and to motivate refugee self-reliance through decreasing energy poverty and assist sustainable natural resource use. Out of the above-mentioned duties and practice UNHCR has been engaged different activities in and around Tierkidi refugee camp such as Tree planting, tree protection, stove promoting and environmental awareness' creations to reach its environmental goals. Generally, the effectiveness of the environmental programmes (mitigation activities) of UNHCR did not bring the necessary result or did not achieve their goals except the following positive signs or indications. i.e. because of UNHCR environmental interventions in and around Tierkidi refugees camp there has been a decrease seedling survival coast and much less efforts in seedling management. Applying a standardized forestry method throughout the camp in markedly varieties of ecosystems has introduced considerably different results.

The tree planting programme has been comparatively uncomplicated to implement, evaluate, monitor and account for in Tierkidi camp. Material properties are produced in the nursery and distributed. Every feature can be quantified, which might also be acceptable in a relief-oriented programme with a very short planning cycle. True environmental benefits, however, have been greater tough to identify.

In the degraded Tierkidi camp refugees have commonly been ready to plant and nurture seedlings that they have received. Survival rate and community participation are higher. Trees are being combined with horticultural cops and vegetation on garden plots. People have engaged in direct sowing of their personal different seeds. There is a perceived require to plant trees to develop products for home use and for sale - such as poles, firewood and fruit. Generally, I can say that the effectiveness of UNHCR tree plantation and protection programs are different throughout the camp. There has been particularly a sign of

success in accomplishing environmental mitigation activities in degraded part of the camp than in less degraded part of the camp.

The essential targets of the stove promoting had been to minimize firewood associated degradation in and round the refugee camp and to mitigate exposure of refugee women and children to banditry and sexual assaults meanwhile gathering firewood. But woman's and children's still travel very long distance up to 15 km to collect firewood. As a result, they are venerable to sexual assaults, cause of conflicts with the host community etc.

The energy efficiency campaign has resulted in excessive adoption rates of elevated stoves in the camp. less than 50% of households have stoves and 85% of households still use three stone traditional stoves in the camp, However, in common with the tree planting program, such information makes for easy monitoring at only a superficial numerical level. Simply counting the number of stoves fails to show the different energy efficiencies actually performed at the family level and the environmental benefits accrued.

An essential statement right here is that a stove will not be used effectively if the situation under which it is used are not conducive to fuel efficiency. However, in Tierkidi camp, where firewood is in comparatively short supply, the refugees have performed a significant reduction in fuelwood consumption to an average per capita weight of 1.8 kg per day. But In the forested part of the camp, the corresponding amount is a significantly soaring 4.3 kg per person per day after three years of consecutive UNHCR and its partners' intervention.

Mr. Hussein reported some results from the assessment on usage of fuel saving stoves that was carried out in 2015, “with the collaboration of UNHCR and ARRA, in Jewi, Kule and Tierkidi. In those refugee camps 31,589 improved stoves were distributed and a survey conducted among 507 households within the 3 camps shows that 38% of the respondents use the fuel saving stoves (FSS) as their primary or and 49.5% as secondary cooking method. The majority of the respondents had to go four or more times a week to the forest to collect fuelwood before they received the FSS. After receiving the FSS, more than 75% goes one up to three times a week to the forest. This means people use less fuelwood reducing the pressure on the forest resources in Gambella” (FAO and UNHCR,2016:6).

. In some parts of tierkidi camp, the presence of forest guards has been vital in the preventive of trees and bushes each inside and outside the camp areas. In the other section of the Tierkidi camp, they have served greater as facilitators of refugee get right of entry to far away fuelwood and constructing pole resources on a rotational basis.

Environmental problems in the Tierkidi camps have been explored in the preceding chapters. It looks that the objectives of the UNHCR's environmental mitigation projects and the EEWG and RC in Tierkidi refugee camp have been pretty certainly stated. "although environmental problems are understood in various ways. While deforestation and the decrease in the groundwater resources are seen as an ecological problem; they also threaten the well-being of refugees and host communities as well as causing conflict between these groups. Indeed, the implementation of the UNHCR and its partners' environmental programs through the EEWG and RC aims at diminishing environmental destruction and guaranteeing the well-being of refugees and host communities. The UNHCR combines these two aims in its programmes, but it evaluates the results of the Teirkidi firewood project mainly by such things as dissemination of energy-saving stoves and planting trees and seedlings, but not by the views of the refugees and host communities on the programmes" (Tiina Salmio,2009:121). Although the environmental mitigation initiatives are supporting build good relationships between refugees and host communities, there is serious conflict between those communities and refugees' communities coming in, Host communities regularly don't have a great deal to begin with. They stay in very terrible circumstances. They have their personal little smallholder farm and all of sudden there's the massive inflow of refugee on their doorstep competing for water, competing for land, and possibility going into their forests and cutting down firewood to cook. The two communities are working side by side on replanting, defending the currently available trees, produce and use of improved stoves, increasing awareness about the environment, etc. We ought to see that it had a certainly profound impact beyond simply the weeks and months that they have been working on this project. We hope that it brings people closer together.¹⁹

UNHCR has environmental awareness and training plan of action for its staff and patterners besides to refugees and the host community in order to increase environmental awareness,

¹⁹Interview on 9 April 2020, at 10:15 pm

improvement of protecting attitudes, and issues to understand the contemporary environmental problems in the study area. For example, according to the data gathered by using questioners and interviews; about the level of concern of refugees and host communities to environmental problems, respondents (who had been participated in environmental education and training sessions at least one time) were asked how concerned they have been about environmental problems. About 29% of the respondents said that they were concerned to a great deal, 48% said that they were concerned to a fair amount, 15% of the respondents said that they were not concerned very much and 4.7% not at all. (see table 10 below) Although there were slight variations in responses within the subgroups, medium levels of concern for environmental problems were apparent from all categories, such as age, gender and level of education. This data shows that UNHCR and its partners environmental awareness practices changed the trainees fairly. Engaging the refugees via this environmental awareness training plan of action in natural resource management has a little bit improved the refugees' sense of ownership and responsibility and accountability whilst benefiting the environment and host communities.²⁰ I interviewed selected refugees, host communities, Ethiopian authorities and experts who works in organizations about the effectiveness of the Energy and Environmental Working Group (EEWG) in Tierkidi refugee camp and refugee councils (RC) (see table 11 below). This may also open up choice views for the comparison of the effectiveness of the environmental programs' implementation. According to most of the respondents; The UNHCR and its partners tasks with the EEWG and RC have partly done their purpose. i.e. the quantity of rapes has decreased, the bad environmental effect of the refugees has been minimized, at least in the camp areas, and environmental rehabilitation is being promoted.

There is additionally improved co-operation on the environment between the refugees and the host community and equally between different organizations and the Ethiopian government. However, host community are nevertheless exasperating that a massive number of refugees proceed the usage of "their" natural resources. As a consequence of the EEWG and RC input and the UNHCR and its partners new set-up of plan of action and camp level regulations and even law over the environment have emerged in refugee camp. In constitutive terms, the environmental programmes in Tierkidi camp can be viewed as less effective. Although time,

²⁰Interview on 10 March 2016, at 10:15 pm

energy and resources have been spent to resolve environmental problems, less effect result were achieved . This is because of lack of finance that is “Funding is the basic problem of the UNHCR’s environmental work. The UNHCR is almost completely dependent on voluntary contributions from governments, INGOs and the private sector to run its programmes” (Tiina Salmio,2009:2).

UNHCR and its partners' environmental mitigation or intervention activities in and round Tierkidi refugee camp; are very small in the number of programs in contrast to UNHCR environmental programs listed in its environmental guidelines of 1996 and 2005 and its coverage in contrast to the severity or the degree and rate of environmental degradation of in the study area; most of the respondents consider that UNHCR environmental activities has less effective and insufficient to reduce firewood collection time , less improved safety for women and children, less reduces conflicts between refugee and host communities, less freed up time for children to attend school, and has had less positive influence on the natural environments in and around Tierkidi refugee camp due to scarce resources.

Table 10 Level of community concern about environmental problems in the study area

Level of community concern on environmental problems \issues	Responses in present
A great deal	29%
Faire amount	48%
Not concerned much amount	15%
Not concerned at all	4.7%

Sources; collected,2019

Table 11: Some Views on Energy and Environment Working Group (EEWG) and Refugee council (RC)

<p>Refugees: A refugee from Tierkidi camp said that since the foundation of the EEWG and RC, there have been small changes (more vegetation, etc.) He mentioned that you could even see all the way from Tierkidi to ITANG Town in 2015, referring to the deforestation in the area. The co-operation functions well with all agencies in EEWG and RC, Indeed, he said that the EEWG and RC, members are interpreters between agencies and refugees. another respondent from Tierkidi refugee camp said that the EEWG and RC, has minimized the market to sell firewood in small amount. She also said that there were misunderstandings between host communities and refugees before, but now they can relatively solve problems between host communities</p>
<p>Local communities: One elder from host community around Tierkidi camp, said that the situation was very bad before the foundation of the EEWG and RC, it has thus helped in managing environmental problems. The elder said that they were tired of the EEWG and RC. For example, its members have been the same since its inception. She thought that the EEWG and RC, could be powerful if agencies would listen to the host communities. She said that they UNHCR don't take anything from us. Other host communities' elder thought that the EEWG and RC, had done lots of work, but it was "dying". However, host communities would like to make it powerful. One of the founding members of the EEWG and RC, commented that the EEWG and RC, was good. However, he also remarked on the top-down approach of the EWG: "People lost hope as the UNHCR was acting as chairmen. They accused the UNHCR of not taking the environment seriously, claiming that the real goal of its environmental programs is to attract funds</p>
<p>Representatives of Organizations: A local NGO expert commented that there was no implementation and action by the EWG. He said the EWG looks nice on paper, but the reality is different. Its approach is top-down, not bottom-up and even its agenda comes from the top. The EEWG and RC, had not had meetings lately, but he claimed that the discussions were dominated by agencies. The EEWG and RC, lacks strength. He also mentioned that since there was a conflict between the EEWG and RC, it would be better to have only the EEWG, and not both the EEWG and RC, An INGO expert said that the EEWG and RC, a little bit reduced tensions between host communities and refugees. A ZOA expert also mentioned that the EEWG and RC, has reduced conflicts between refugees and host communities in small degree. He said that it was created to develop the sense of 'we feeling' and to enforce the local governance. He considered that the EEWG and RC, was a very good, positive intervention as different actors come together to solve environmental problems. The problems are solved together with the different interest groups and "everybody" is involved in forming the environmental programs.</p>
<p>Representatives of the Ethiopian Government Authorities (ARRA): The district authority in Tierkidi said that the EEWG and RC, has increased awareness of the environment in a small degree, being a link between the agencies and the community as well. The Itang town authority also mentioned that the EEWG and RC, was created to develop solidarity. It is one way of enforcing local governance. However, he thought that the EEWG and RC resolutions were not very effective. Other town authority criticized the domination of the UNHCR and said that action was not taken in the EEWG and RC, because UNHCR is a chairman. However, some experts accused of the UNHCR not taking the environment sufficiently seriously. The UNHCR has been working relatively hard on the environment, taking its limited mandate into consideration. The documents and interviews indicate that the UNHCR has invested time, energy and resources in the environment even although it needs huge improvement.</p>

Sources; collected,2019

4.5 Challenges of effective implimantation of UNHCR environmental management in and around Tierkidi refugees camp

In spite of UNHCR ambitions and several new initiatives and incentives, a tremendous environmental guideline implementation gap exists. This is due to the fact of numerous challenges that have been faced by UNHCR and its partners' which includes host government. some of the following are:

4.5.1. Social factors

In the study area, *Because of Poor* awareness regarding to environmental issues among, the politicians, and bureaucracy is compounded by the low levels of literacy and the poor mass media concern. Refugees and host communities at all levels are severely limited by lack of adequate and useable information as also lack of clarity and understanding on environmental mitigating activities and negative impacts of degraded environment. This creates the gaps about environmental issues and encouraging illegal actions to the distraction of natural environment and unwillingness to participate in environmental protection activities. Another serious problem in this regard is, refugee and, host communities are normally not conscious of environmental health problems.²¹ Refugees (most of them from South Sudan) and host communities are Ethiopians have a culture of un proper or un wise use of using natural resources like forests. Thus, it is a greater challenge of UNHCR and its partners environmental management activities in and around Tierkidi refugee camp. In and around Tierkidi refugee camp, Social elements are always concerned for both environmental conservation or UNHCR environmental management activities, such as environmental degradation. The predominant social factor problems are refugees who do not have ownership to the land are not probably to make investments their time and different resources in conservation or enchantment of the environment.

Neither the host communities nor refugess that lack stable social institutional structure likely to establish and maintain essential infrastructure and services that enable, encourage, and coordinate refugees' efforts to implement land improvement and conservation measures.²² The conservation of soil, water, and biotic resources (UNHCR environmental management activities) is a collective societal concern (refugees and host communities), and an intergenerational one, not merely a private concern of both communities utilizing the land directly at any particular time. In and around Tierkidi refugee camp the principal social problem is the socio-cultural practiced by both refugees and host communities that marginalized full participation of women in the management of their society's physical,

²¹Interview on 8 April 2020, at 12:15

²²Interview on 9 April 2020, at 12:15

organic and human resources, this highly hinder UNHCR environmental management practices in and around tierkidi refugee camp.²³ “Research findings showed there was a significant relationship between knowledge, awareness and attitudes to the practices of the environmental management. This shows that to improve the environmental practices, refugee and host community should be provided with the knowledge to build awareness and develop a positive attitude towards the environment” (Arbaat, H., A.R. Norshariani, and S.S.A. Sharifah. Intan; 2011:7).

Correspondingly, in and around Tierkidi camp there are a few social factors that adversely affect UNHCR and its partners environmental management activities, these are refugees, host communities, and local government officials, and the bureaucracy has a lack of knowledge awareness and positive attitude towards environmental issues, the problem of land ownership, women are no longer fully engaged in environmental activities and decision-making issues, lack of robust social network in both refugees and host communities, and so forth.

4.5.2. Economic factors

According to the Itang woreda ARRA office, the most essential economic factors that severely hinder UNHCR and its partners environmental management (mitigation) activities in and around Tierkidi refugee camp are lack of budget and poverty.

In the future environmental problems will be escalating because of high influx of refugees from South Sudan as political instability continues and high natural population increase in host community and as well as refugees as the result environmental management practices need high levels of funding. Specifically, for environmental mitigation measures, employee environmental training programs and appropriate equipment, and added difficulty for local organization or institutions with a limited budget.

According to Itang special woreda ARRA office the allocated budget for Tierkidi refugee camp environmental mitigation activities in 2016-2019 ranged from “0.5% to 2.5%” of the whole expenditure for other different programs such as relief food, water, health, education and etc., this points out financial constraint or lack of budget. Generally we can say that there is a declining trend except some budget increment in 2019, although we could not expand the local

²³Interview on 7 April 2020, at 12:50

environmental mitigation program budget as planned because our organization did not get enough fund from the donors as before so that our organization faced severe financial problem and most of financial resources went to other lifesaving projects. Therefore, lack or limited financial capacity can lead to cut of environmental protection programs, shortages of needed inspection vehicles, up-to-date testing equipment, and skilled staff.²⁴ year to year and time to time environmental mitigation budget shows significant decreasing, because of this we are forced to minimize the size of some mitigation activities in the study area.²⁵ Another important factor that negatively affect UNHCR and its partners environmental mitigation programs in and around Tierkidi refugee camp is the label of poverty that existed in both refugees and host community. It is significant for everybody to perceive that poverty and environmental management programs (mitigation activities) are interrelated in the study area. Poverty among the displaced person and host communities puts a challenge on the environment by, unwisely consuming of water, food, shelter, energy and other from natural resources in order to stay alive this is because there are no alternative income generating/livelihood activities in Tierkidi refugee camp. so that the refugees are entirely dependent on natural resource. Through environmental problems cause extreme hurt to the poor by averting refugees and host communities from having sustainable and affordable energy, water, food construction material, livelihood, good, and hygienic living standards, This situation outcomes in a huge obstacle for UNHCR environmental management or mitigation practices in the study area. Poverty frequently makes individuals put generally more focus on the environment or natural resource which brings about environmental degradation, improper human waste disposal leading to unhealthy living conditions, more pressure on fragile land to meet their needs, overexploitation of natural resources and more deforestation. Then again, a degraded environment makes the lives of displaced people and the host community hopeless. Along these lines, it brings about an enormous challenge for UNHCR and its partner's environmental mitigation activities in and around the Tierkidi refugee camp.²⁶

There are a number of viable explanations for these results, it is greater tough for UNHCR and partners to enhance the dwelling environment for the poorest refugees and host communities, so they had been affected greater substantially by degraded environment such as un proper waste disposal, polluting air and eroded land, etc.

²⁴Interview on 18 February 2020, at 12:15

²⁵Interview on 19 February 2020, at 12:15

²⁶Interview on 17 February 2020, at 15:15

The study consequences revealed first like any type of some other project; UNHCR and its partners' environmental management activities in and round Tierkidi refugee camp is normally tremendously based on the availability of budget. But the budget allocated by UNHCR and its partners for environmental mitigation activities in the study area for the previous 5 years indicates a reducing trend. Secondly, Poverty and environment management are intently interrelated. As refugee and host communities dwelling in poverty are the fundamental reasons of environmental harm this is due to the fact that the poor are compelled to deplete resources to survive, and this degradation of the environment further impoverishes people. That is poverty amongst refugee and host community puts stress on the environment by, unwisely consuming of water, food, shelter, energy e.t.c from natural resources in order to continue to be alive. whereas environmental problems a reason for extreme hurt to the poor through averting refugees and host communities from having sustainable and affordable energy, water, food, construction material, livelihood, appropriate and hygienic dwelling standards.

This situation consequences in a huge obstacle for UNHCR environmental management or mitigation practices in the study area. High potential for poverty-related illegal collection of forest products, inability of refugees and host communities to invest in sustainable resource management. Refugees and host community poverty often results in high dependence on natural resources (especially for wood fuel, food, timber and non-wood forest products) for domestic consumption and for income-generation. Thus, it is a challenge or hinder UNHCR and its partners environmental management or activities in and around Tierkidi refugee camp.

4.5.3. Political factors

“Political capacity constraints of environmental management can result from (1) coordination difficulties due to a fragmented environmental bureaucracy, (2) conflicting priorities within implementing agencies, and (3) low bureaucratic status and authority granted to environmental bureaucracies.” (world bank group; 2014:22) Responses to the inquiry on whether the concerned (eligible persons for this research) respondents perceived political factors such as fragmented environmental bureaucracy, conflicting priorities and low bureaucratic states and authority as a factor that negatively affect UNHCR and its partners environmental management or mitigation activities in and around Tierkidi refugee camp have shown that; coordination difficulties due to a fragmented environmental bureaucracy (88%), conflicting priorities within implementing

agencies,(77%) and low bureaucratic status and authority granted to environmental bureaucracies(76%)(see table 12 below).

4.5.3. 1.Fragmented environmental bureaucracy

The implementation and enforcement of environmental mandates at the local level is partly hindered by the fragmented and ambiguous allocation of environmental responsibilities. Usually, several governmental and non-governmental organizations are responsible for the implementation of a single environmental problem but sometimes without a clear division of labor, which in practice ultimately leads to a lack of accountability. For example, greater than 3 organization(bodies) have a role to play in energy efficiency implementation programme in and around Tierkidi refugee camp. Such as Gambella region Natural Resource and Environmental Protection (NRDEP), ARRA, ITAG woreda agricultural office, Environment, Forest, Climate Change Commotion (EFCCC), etc.

Fragmented bureaucratic hierarchy lead to a variety of coordination problems, that have adversely affected local or in and around Tierkidi refugee camp leaders' efforts to develop comprehensive, sustainable environmental protecting measures. During filed tripe time I discovered that at the woreda or camp level, local five-year plans, contingency environmental plan and current environmental plan all observe a special time horizon, which makes coordination very tough. There are different coordination problems for example actors involved in the planning process are follow their own styles, interests and compete for power, making the environmental mitigation of comprehensive environmental protection planning yet more difficult.²⁷

4.5..3. 2. Conflicting priorities

Implementing agencies and organizations (bodies) additionally face more than one and occasionally conflicting objectives concerning environmental management practices in and round Tierkidi refugee camp. For example, Gambella region Natural Resource and Environmental Protection (NRDEP)is in responsible for of a couple of functions; its primary interest lies in natural resource conservation particularly construction of terracing and reforestation, whilst at the equal time it is additionally responsible for overseeing energy

²⁷Interview on 17 February 2020, at 12:15

efficiency and local weather and climate change issues. This conflicting priority resulted a huge challenge for UNHCR environmental management activities in and around the study area.

4.5..3. 3. Low bureaucratic status and authority

The implementation capacity of local organizations in charge of environmental mandates is further constrained by their low bureaucratic status and rank within the local political hierarchy. In the study area, Local agencies, organizations (bodies) in charge of enforcing Tierkidi refugee camp binding environmental targets vary in their political status within the locality. Mostly we are holding back for our federal bureau announcing to determine easy cases, generally, each governmental and non-governmental institution which includes the UNHCR system is pursued from a top-down approach, this makes the regional and local environmental management week in decision making.²⁸

In addition to the above-mentioned political troubles or challenges, there are additional limits on Public and Private Participation. This barrier at the local or regional level is constrained possibilities that exist for the participation of local or regional non-state actors to enhance environmental management. An excessive degree of participation by non-state actors is viewed to be essential in teaching the refugee and host community about the environmental issue; it comprises each public values and preferences into decision-making; it reduces conflict, and it makes decisions the most cost-effective. Refugee and host community participation in environmental improvement activities can additionally increase the legitimacy of UNHCR environmental management. The study results revealed that coordination difficulties due to a fragmented environmental bureaucracy, conflicting priorities within implementing agencies, low bureaucratic status and authority granted to environmental bureaucracies and Limits on Public and Private Participation are the most important political factors that negatively affect UNHCR and its partners of environmental management activities in and around Tierkidi refugee camp. It is highly confirmed by the respondents.

²⁸Interview on 18 February 2020, at 12:15

Table 12 Political factors affects UNHCR environmental management programmes in Tierkidi refugee camp in percent

Political factors	Respondents response in percent (%)
Fragmented environmental bureaucracy	88%
Conflicting priorities	77%
Low bureaucracy status and authority	76%

Source; collected,2019

4.5.4. Institutional factors

UNHCR Environmental management Implementation cannot be achieved without strong institutions with sufficient resources and capacity to carry it out. Virtually every case study undertaken for this review reported that limited capacity of one form or another constrained UNHCR environmental management implementation. “Institutional factors are one of particularly significant reason why UNHCR environmental guidelines are often not well implemented at the camp level. While it is not possible to analyze all dimensions of these institutional challenges such as: shortcomings in refugee camp planning system and policy instruments; weak economic and political incentives for local implementers; low levels of public participation and private sector involvement; and insufficient implementation capacities of local agencies in charge of environmental management implementation.”(world bank group,2014:7) Even though all previously mentioned institutional problems appear in the study area, the researcher is seen only in three most significant institutional factors, responses to the inquiry on whether the concerned (selected people for this research) respondents saw institutional factors, such as lack of technology, lack of technical staff and lack of management commitment as a factor that negatively affects UNHCR and its partner's environmental management activities in and around Tierkidi refugee camp have indicated that; environmental management difficulties due to not using a new generation or up to date of technologies(91%), environmental management difficulties due to shortage of trained staff and insufficient numbers of staff to apply environmental mitigation measures,(89%)and environmental management difficulties due to less concerned over environmental issues and reluctant to allocate adequate financial, technological and human resources to implement environmental mitigation and protection(65%).(see table 13 below)

Table 13 Institutional factors affecting UNHCR environmental management programme in Tierkidi camp in percent.

Institutional factors	Respondents response in percent (%)
Lack of technology	91%
Lack of technical staff	89%
Lack of management commitments	65%

Source; collected,2019

4.5.4. 1. Lack of technology

Ecological issues require another age of advancements and technologists who can intercede, comprehend social setting and imperatives, and organize participatory exercises that draw in and enable individuals. “There is a great reliance on technology to solve environmental problems around the world today” (Beder, S.;1994:1). “The verification of environmental outcomes, a key component of effective environmental management, is a difficulty faced in many localities and refugee camps due to a shortage of advanced monitoring equipment” (world bank group,2014:7).

Addressing environmental challenges through environmental protection projects (mitigation activities) in refugee camps like Tierkidi, requires searching at all applicable research, understanding socio-environmental context, coordinating various evidence, and engaging with the public to resolve problems or make policy. Engaging with dialog can reach greater significance and appropriate outcomes. Environmental technological know-how has a distinct role, making use of science, policy, engineering, and social change to tackle environmental difficulties and bring sustainability in Tierkidi refugee camp. But the information collected during the field trip from two environmental officers one from UNHCR and the other from NGO confirmed that the monitoring tools in and around Tierkidi refugee camp is not very technically advanced, unreliable, and too few in number. In spite of the fact that it is very costly in terms of staffing requirements and time consumption, sending regular inspection groups is viewed to be quite essential to protect false reporting. This situation faced a huge challenge on UNHCR environmental management in the study area.

4.5.4.2. Lack of technical staff

UNHCR and its accomplices ecological management exercises likewise in ceaseless need of very much prepared staff and adequate quantities of staff to apply natural relief gauges as needs be the standard of UNHCR ecological rules and to carefully screen the exactness of detailed figures and

focuses in and around Tierkidi exile camp. With new technologies enhancing the effectiveness of the UNHCR environmental management plan of actions (mitigation activates) and changing the way the institution works, for example, in the direction of extra multitasking or teamwork, demand for higher-skilled workers is increasing. Adequate and Higher-educated staff are in fact greater capable to accomplish excellent outcomes on environmental protection (mitigation activities) in and around Tierkidi refugee camp than ineffective and much less educated staffs. “Organizational changes are in part a consequence of technological changes and skills upgrading” (BV. ECORYS Nederland,2010:16). Such an adequate number of talented staff are required, for instance, in choosing which mitigation measure reasonable to a specific ecological problem and which technic is proper to the estimation of and exercise of environmental protection. UNHCR, ARRA and NGOs environmental officers, working in Tierkidi camp frequently admitted that sector-specific technical know-how is required to be capable of projection the negative effect of environmental degradation on refugee and host community, the accomplishment of UNHCR environmental mitigation measures, and censoriously inspect partners of UNHCR which engaged in environmental conservation activities, self-reported of environmental mitigation attainment or reports. They added that for the previous three years, their bureau did not higher any new staff in spite of rising environmental rules and new responsibilities. We have consistently requested new staff educated as environmental professionals nevertheless the top managers at the federal level did not send us any. It is irritating due to the fact that without certified personnel we can't do our work well. UNHCR officer, in particular, brought the lack of formal and casual education of office personnel in environmental sciences is also seen amongst the top leaders in the UNHCR.²⁹ Generally, the researcher concluded that UNHCR, ARRA, NRDEP, and different partners' environmental departments have very few staff some have only one or two members and they been not employed or operate new generation technologies. This create a huge challenge on UNHCR environmental management and mitigation activities in the study area.

4.5.4. 3.Lack of Management Commitment

Top management in most of the stakeholders that engaged in environmental mitigation activities including UNHCR and ARRA are much less worried over environmental problems and reluctant to allocate sufficient financial, technological and human resources to enforce environmental

²⁹Interview on 19 February 2020, at 12:15

mitigation and conservation practices in the study area. UNHCR, ARRA and NGOs environmental officers, working in Tierkidi camp frequently admitted top managers particularly UNHCR and different donor organizations and institution managers have been given much fewer attention or treat to environmental protection and conservation (a small quantity of budget, very few numbers of manpower allocation and etc.,) in the study area ³⁰. Responses to the question do you compare UNHCR environmental programs with other programs in the budget , human resources, and time allocation,(selected people for this research) respondents saw Institutional factors especially towards environmental issue consideration of managerial commitment, responds, In budget allocation, Much less (98%) and A little less (2%), Inhuman resource allocation, Much less (95%) and A little less (5%), Time allocation, Much less (92%) and A little less (8%)(see table 14 below) Setting an environmental dedication from top officials will reduce the vision or strategy that requires top officials' involvement to create an accepted approach to lead the organization's effort to achieve the vision that is, to fulfill the wishes of refugees and host communities without degrading the natural environment in and around Tierkidi refugee camp. top officials assist has an essential element for the successful environmental management strategy (mitigation activates) The huge degree of participation of the top officials in environmental protection and conservation implementation acts as an appropriate measure to show the organizational dedication to the environment. top officials should inject a robust tradition that allows maximum freedom and leads the worker to make environmental enhancements without any intervention.

Environmental management in the study area requires enormous participation from all stages inside the institution and this is viable solely if the management is greater committed. Management assist is regarded as necessary in enhancing the effectiveness of environmental management procedures and it is one of the fundamental success factors. Managers are the primary determinants of environmental management in and around Tierkidi refugee camp and they play a crucial function in hiring enough knowledgeable manpower, allocate the necessary budget; using new generation technology, supervising environmental mitigation activates, and influence refugees and host communities. And averting shortcomings in refugee camp planning system and policy instruments; insufficient financial and political incentives for local or regional implementers; low status of public participation and private sector involvement; and inadequate

³⁰Interview on 8 April 2020, at 12:15

implementation capacities of local or regional organizations, as a result, guarantying that environmental protection and conservation (mitigation measures) is carried out ineffectively and it will be a challenge for UNHCR environmental management or mitigation activities.

Table 14 Comparing UNHCR environmental programs with other programs in and around Tierkidi refugee camp

Resources	Much less	A little less	Almost equal	A little bit higher	Much higher
In budget allocation	98 %	2%	0	0	0
In human resource allocation	95%	5%	0	0	0
Time allocation	92%	8%	0	0	0

Source collected ,2019

4.6 The state of environmental security and factors affecting

4.6.1 The state and trends of environmental security in the study areas

Ecological clashes have developed as key issues testing nearby, provincial, national and worldwide security. Ecological emergencies and issues all through the world are across the board and expanding quickly.

Today, concern and desire in environmental security studies is better than ever, mostly due to the fact of the tremendous acceptance of anthropogenic global climate change and its associated results for national, international, human, and biosphere security. Environmental security as a term has been used as a platform for transferring away from ordinary understandings of national security and for this reason linked to agendas such as human security. UNHCR’s Environmental Guidelines (1996) identifies six categories of environmental impact: such as, natural resource degradation; irreversible impacts on natural resources; impacts on health; impacts on social conditions; social impacts on local populations; and economic impacts” (Adrian Martina,2005:332). these all have consequences on environmental insecurity i.e. water insecurity, energy insecurity, food insecurity, health hassle etc.in, and around Tierkidi refugee camp. Key environmental and resource constraints, including health risks, climate change, water scarcity and increasing energy needs will further shape the future environment security in and around refugee camps and have the potential to significantly affect the UNHCR environmental management planning and operations. Empirical research by Aukot suggests that the “relationship between the host community and refugees relatively good in the first years of the Tierkidi refugee camp existence, this good relationship has declined over time”(Aukot 2003:76).

Environmental insecurity in the study area results, due to the fact that the presence of refugees in Tierkidi camp since 2014 led to environmental degradation with the aid of placing pressure on local or nearby resources such as firewood, grazing land, water and sanitation. For example, woman's and children travel a very long distance which is more than 15km outside Tierkidi refugee camp, it causes conflict with the host community, as a result woman may face sexual harassment and if the worst comes death. And the blended demand for firewood and building materials from the forest used to be considered for each and every refugee and host communities. Competition for natural scarce resources in the study area has been high, as the refugees have not entirely acquired resources they desired inside the camp. And excessive or giant refugee actions and long-term encampments can exacerbate tensions over resource access to (firewood, water, improper solid waste disposal, grazing land etc.) which can also spill over into violence.³¹

As such, due to the fact that the arrival of refugees to Tierkidi camp, the host community was already experiencing inadequate water supply which had severely affected them. The locals and refugees alleged that their women are compelled to journey very long distances to get water, ensuing in health problems for them, such as the back, chest pain, etc. Lack of adequate water in and around Tierkidi refugee camp has been triggered through deforestation and resultant soil erosion.

This has threatened the food security of the host community, who rely on pasture and water for survival. The massive needs on the scarce nearby water resources between the refugee and the host communities have, therefore, given an increase to conflict between them. He additionally explained on the same note, the refugees competing with the host community over grazing land for their livestock has also made things difficult in the study area. Generally, In Itang woreda as a whole particularly in and around Tierkidi refugee camp, the competition for scarce natural resources triggered conflict instead of cooperation between the two communities. The study area confronts a serious environmental hazard and health trouble due to poor waste disposal. Both liquid and solid wastes are disposed of indiscriminately all over the camp and its surrounding area. More so, there is a lot of stress on sanitation facilities, such as the camp and the village public latrines and the few rubbish containers. This problem grew to become one of the causes of the source of hostilities between refugee and host communities. He besides describes that the

³¹Interview on 9 April 2020, at 12:15

Refugee-Host communities' tensions and conflicts have escalated in the immediate past around the globe. The anxiety and hostilities are majorly triggered through the shared limited resources and lack of refugee-host Community projects. In most cases, the host-community views refugees as threats to their scarce resources which include; land, wood, jobs, grazing land and water, specifically as refugee populace increases. In the Tierkidi refugee camp and its surrounding context, the host community belief that refugees acquire extraordinary treatment considering they are unable to access to fundamental services such as education, health, water, and greater importantly getting food that is effectively accessible to refugees in tierkidi Camp.³²

Host communities, who are substantially outnumbered by the refugees, strongly expressed the view that life used to be significantly simpler before the arrival of the camp. Resources such as water, land, forests, and wildlife have now gotten more scarcer, and they blamed the refugees for this. They additionally complained about refugees stealing their crops and firewood, spoiling their regular grazing lands. When the camp used to be positioned here, UNHCR had seemingly promised a variety of benefits, together with a new school in the village. These benefits not at all materialized, and this has contributed to a view of happening that host community themselves as victims and refugees as privileged. So that this situation consequences in anxiety and conflict between refugee and host communities.³³

Clashes among hosts and refugees were more frequent in the past and continuous to the present, we have just negative encounters (problematic) with refugees in Tierkidi camp. That is the relationship is highlighted by hostility, violence, and frequent conflicts among host communities and refugees. For example, violence conflicts have recently occurred in the study area.³⁴ The relationship between the two communities is difficult. The relationship is featured through usual disputes and each day complaints from each party. Refugees generally complain about robberies and assaults committed through the host community. Host communities argue that the refugees usually blame them due to the fact they desire resettlement away from the camp. He besides explains that in general, each community accuse one the other of crimes. It is not usually simple to pick out which allegations are genuine or not. Each community accuse one after the other of their lawbreaker activities. He besides emphasizes that there is an increasing desire for greater

³²Interview on 8 April 2020, at 12:15

³³Interview on 8 April 2020, at 12:15

³⁴Interview on 8 April 2020, at 12:15

interest and moves in the direction of the relationship issue. But human and financial constraints inside the UNHCR Peace building unit make it challenging to solve problems associated to the host community.³⁵

The relationship between the two communities is not excellent and not likely to be in the near future. The refugee camp is the fundamental place where refugees and hosts interact. The most frequent areas are at markets, food distribution centers, water collection point, in time firewood collections, and when host communities work for refugees. Refugees also come near to the host community outside the camp for different motives such as gathering firewood and once in a while herb. He besides identifies the most important cause of hostilities or conflicts between hosts and refugees relating to the scare's resources and bad situation the host community is dwelling in. He similarly argues that refugees stay in a much higher benefit than the host community.³⁶ In addition, unequal assist through humanitarian organizations contributes to the host community feeling marginalized and unfairly treated. According to Itang Worda office "80% of all NGOs and INGOs programs in and around Tierkidi camp are directed to the refugee population while around only 20% is related to the host community" (Itang Worda Office,2020).

Non-sustainable process or use of natural resources e.g. deforestation, over exploitation of resources poor land use planning and ecosystem contamination; natural environmental change or events e.g. climate change, climate variability extreme weather condition etc.; poor government activities e.g. corruption, poor banking and economic policy etc.; and human activities such as population growth, migration, poor cultural practices towards environment, ethnic conflict all these together results shortage of resource, ecosystem degradation loss of agricultural productivity, disses ,economic decline, migration, institutional collapse etc. which leads to environmental conflict or violent thus makes week or low environmental security (environmental insecurity).

"There are three different rationales for connecting the environment and the security narratives. The first and the most basic one is that of an environmental event of either scarcity or abundance, which triggers conflict and then escalates into a security issue. The second rationale relates to the

³⁵Interview on 8 April 2020, at 12:15

³⁶Interview on 6 April 2020, at 12:15

environmental footprint of security measures that could have an environmental impact, which can trigger scarcity and then the same causality of scarcity leading to security could be applied. The third rationale connects environmental events such as droughts or flood to collective action among countries, which leads to peace building measures, also a dimension of security” (Shilpi Srivastava and Lyla Mehta, 2014:4). In such a case, environmental scarcity which triggers hostilities and struggles and then escalates into a security problem will become a platform for low environmental security (environmental insecurity). The resources possibly to be the sources of environmental insecurity are a competition among refugees and the host community over scarce resources like food, energy, water, and land, etc.

For many host communities, the management of the local forest resources used to be secure until the coming of huge refugees who accelerated the demand on the local and regional environment. This can lead to a growth in violence among the two communities i.e. refugees and host communities in and around Tierkidi refugee camp, as they each depend on similar resources to survive. “Environmental security views ecological processes and natural resources as sources or catalysts for conflict and as barriers or limits to human well-being, and conversely as a means to mitigate or resolve insecurity. Environmental security is understood as a foundation of human security more broadly, essential to sustainable livelihoods, health, and well-being among households and communities” (Blake D. Ratner, 2018:6).

The majority of the respondents argue that conflicts described at the community level between hosts and refugees have been most widespread in the years between 2014 and 2019. These conflicts took area each in the refugee camp and in villages. Many of these conflicts have begun from smaller incidents and then escalated, the principal reasons at the back of these conflicts relate to matters such as the dispute over - firewood, grazing land, water, and the complications of food scarcity in and around Tierkidi refugee camp. Conflicts between refugees and the host community are nevertheless frequent. Despite the implementation of a variety of environmental protection and conservation initiatives supposed to mitigate future degradation and rehabilitate already degraded areas, useful resource depletion and degradation is nevertheless enormous trouble for each of two i.e. refugees and the host community. That consequences in low environmental protection (environmental insecurity) in the study area.

4.6.2. Factors affecting environmental security in and around Tierkidi refugee camp.

The representative of workshop on TCP\ETH\3602 “Supporting the energy needs of refugees and host communities through the establishment of sustainable wood fuel management strategies and plans in Ethiopia acknowledged that since the establishment of the Tierkidi refugee camp, the natural resources in the area are negatively impacted by the presence of hundreds thousands of refugees and host communities have become increasingly sensitive to the depletion of natural resources around the refugee camp. Conflicts over scarce resources, in particularly over firewood collection and water have led in many cases to a strained relationship between refugees and host communities in and around Tierkidi refugee camp” (workshop on TCP\ETH\3602; 2016:6).

Ecosystem degradation, resource competition, or inequitable distribution of benefits increase vulnerability and conflict risk “Environmental security views ecological processes and natural resources as sources or catalysts for conflict and as barriers or limits to human well-being, and conversely as a means to mitigate or resolve insecurity” (Scott, C.A. and Thapa, B. 2015; Blake D. Ratner,2018:5). Environmental degradation is a cause of human insecurity and in many cases serves to aggravate other sources of social division based on factors such as ethnicity, class, religion or economic position.

Now adays there are environmental conflicts in and around camps of developing, countries including Tierkidi refugee camp, many caused by extractive activity that polluted or damaged the land, air, water, forests and livelihoods of refuge and host communities. Such conditions may contribute to sustained social conflict, often with sporadic violence generally low or week environmental security in and around Tierkidi refugee camp. The main factors that negatively affect environmental security are Limited (scares) resource and Socio -political factors, *responses to the inquiry on whether the concerned (eligible persons for this research) sixty respondents perceived Limited (scares) resource and Socio -political factors, that negatively affect environmental security in and around Tierkidi refugee camp have shown that; Limited (scares) resource factors such as shortage of water, energy, building material, land, and high goods prices b/c of increasing demand (95%), Socio -political factors such as marginalization of a certain group and shortage of social infrastructure like sport and medical facilities, and in prober waste disposal (53%).(see table 15 below)*

Table15 Factors negatively affect environmental security in Tierkidi camp.

Factors negatively affect environmental security	Respondents response in present (%)
Limited (scarcity) resource factors such as shortage of water, energy, building material, land, and high goods prices b/c of increasing demand	95%
Socio-political factors such as marginalization and shortage of social infrastructure like sport and medical facilities, in proper waste disposal	53%

Source; collected; 2019.

4.6.2.1. Limited (scarce)Resource Factors

The flood of displaced persons in bigger numbers builds the number of inhabitants in a given zone and this can produce issues to the host network regarding putting more weight on effectively scant assets. Furthermore, because of shortage of assets in zones that exiles put to live, the displaced people and the host networks regularly are in clashes as they keep on applying pressure on those assets and which over the long haul may wind up depleting them. For the most part, Limited (scarcity)resource are factors that adversely influence the relationship between refugee and host community, that is rivalry for this rare resources stays as a significant source of dispute in and around Tierkidi displaced person camp, these limited or scarcity resources are; land, water, forest destruction and collection of firewood and too expensive goods prices due to increasing demand. There is growing consensus that scarce resources and high goods prices due to increasing demand because of environmental degradation can and does trigger, amplify or cause conflict and instability in and around Tierkidi refugee camp, and a growing concern that environmentally induced conflict and insecurity might increase.

The connection between limited(scarce) resources because of environmental degradation and conflict or insecurity feels right. It appears to be naturally right to expect a direct correlation between scarce resources environmental degradation on the one hand and social disruption, conflict, and insecurity on the other. For example, water is an irreplaceable, unique, and scarce resource for sustaining life “Water is a necessity of life, and we use it for drinking, washing, agriculture, and industry.

The United Nations World Water Assessment Programme estimates that every individual need 20–50 liters (21-53 quarts) of clean water every day” (World Water Assessment Programme

Report, 2007:4). As it is a considerably more immediate survival- need than some other sustainable natural resources, access to water is frequently positioned as one of the top next to firewood need by the refugees and host community in and around Tierkidi displaced person camp. Water is a renewable resource and competition or conflict over water is a typical environmental conflict or insecurity. Refugees and host communities in Tierkidi camp need more access to clean water since the arrival of refugees in the study area Often, they live, in regions where there are no plentiful water resources and put considerable stress on existing water supplies regarding amount and quality, in this way it brings about worst clash and conflict among refugee and host community. The Failure to sustain a secure water supply will inevitably lead to environmental conflicts and insecurity (low or week environmental security)³⁷

“Forests are another resource that occasionally causes environmental conflicts or insecurity in and around the refugee’s camps” (Kumssa,Jones, & Herbert, 2009). Generally, specially firewood is the top factor that negatively affect environmental security in the study area, Limited (scares)resource are factors that negatively have an effect on the relationship between refugee and host community, that is competition for the host community and the refugees frequently used wood for home consumption for example; cooking, heating, lights and constructing semi-permanent shelters. Both of them additionally used wood as source of income and earnings whereby building sticks, firewood and charcoals are sold for the motive of getting income.

The refugees and the host community population cut or use woods from the nearby shrubs and forests causing to conflicts in and around Tierkidi refugee camp. Usage of forests in and around Tierkidi displaced person camp, is characterized by a number of clashes and conflicts that are the consequences of the way where collecting activities are done, and furthermore of the different interests of Forest, User groups, for example, host community and refugees. Thus, this prompts over misuse or overexploitation of the woodlands, as each forest user tends to guard their interests. This results in a conflict between the refugees and the host community. Therefore, this conflict and clash consequence in environmental insecurity by contributing to food insecurity, energy insecurity, water insecurity, and lack of shelter and other needs.³⁸

³⁷Interview on 6 April 2020 at 12:15

³⁸Interview on 6 April 2020, at 12:15

“Land is a finite resource” (Beverley Henry, Brian Murphy and Annette Cowie,2018:32). In addition to these grazing Land is a scarce useful resource that results conflicts. This has created rancor that has triggered regular conflicts seen between the refugees and the host community in and around Tierkidi refugee camp. Because of environmental degradation due to the excessive inflow of refugees and natural population growth in the host community and refugees, land that can be used for private or grazing purposes is turning into more and more scarce. Refugee and host communities frequently have strong emotional and symbolic attachments to grazing land and the natural resource on it. It is convenient to see why competition for control of precious grazing land, can reason or maintain hostilities and conflict between refugees and the host community subsequently causes environmental insecurity.³⁹

4.6.2.2. Socio -political factors

The outcomes of environmental degradation, in particular these associated to fuelwood gathering, are felt with a specific pressure on women and children. Women have to spend long hours in search of and carrying wood, activities which put them at increased threat of fatigue and vulnerability to assault as well as detracting from their child-care and family and social features thus consequences in conflicts among refugees, host communities, and between them. moreover, things such as health, education, sports, and transport infrastructure and services i.e. the social services provision to the refugee in different camps has not been an effortless task due to the fact the non-stop inflow of refugees is still witnessed and this escalates competition for the scarce resources. The host community does not have these infrastructure and services and are compelled to go and share with the refugees which in most cases consequences in anxiety and conflicts between refugee and host community therefore consequences in environmental insecurity.⁴⁰

Resource capture by politically powerful groups leads to an increase in the wealth gap between the elites and marginal groups. This wealth difference not solely reason for grievances among the local populace but also enhances the vulnerability of the most deprived individuals and groups. In the case of the study area, most of the host communities accept as true with that refugees are well handled and most benefited by NGOs and INGS such as UNHCR, then they, and they sense as they are neglected by governmental and non-governmental organizations. When resources are scarce, political instability makes refugee camps much more vulnerable to conflict. Instability

³⁹Interview on 7 April 2020, at 12:15

⁴⁰Interview on 7 April 2020, at 12:15

affects not only the governance structure but also all other institutions like UNHCR that engaged in environmental management activities in and around refugee camps. There are occasionally conflicts between Anuak and Nuer nationalities due to the fact of controlling the scarce resource. Political conflicts that flip violent frequently causes in the destruction of the environment and infrastructure in and around tierkidi refugee camp. Conflicts often damage infrastructure, such as roads, houses, and other camp and host community facilities, this fragile government and other organizations structure in and around Tierkidi refugee camp, because of political instability causes environmental conflicts and insecurity.⁴¹

Because of a huge number of refugees, in and around Tierkidi refugee camp “increase demand for food and other essential commodities automatically leads to price rise in the market which they will stimulate local economic activity although not the poorest population in the host community” (Witchayanee Ocha; Ms Jecinta Anomat Al, page,2018:307-308). The influx of refugees is felt in the local markets. While sections of local population may benefit, the local poor are usually affected adversely as refugee demand forces up the price of fuel. The large inflow of refugees to camps has introduced competition between the host neighborhood and refugees over vital resources such as food, water, housing, land, and fundamental social facilities such as health centers. This with time will result in inflationary pressures on prices of goods and services and decrease wages. furthermore, they described the presence of refugees and international aid agencies force up the price of house rent, houses for the workplace and residential functions for domestically engaged staff workers, increasing-price of restaurants, demand for food and other different commodities increases in the market which encouraged the local economic inflation and the price of some goods far-off the ability of the host community. This extra inflationary stress increase competition between refugee and host community on water, energy food, etc. causes environmental conflict or hostilities and insecurity in and around Tierkidi refugee camp.⁴²

The inflow of refugees in large numbers will increase the populace of a given region and this can generate troubles to the host community in terms of putting greater stress on already scarce resources. In addition, due to Limited (scarce) resource factors such as scarcity of water, energy,

⁴¹Interview on 7 April 2020, at 12:15

⁴²Interview on 7 April 2020, at 12:15

constructing material, land, and excessive goods expenses b/c of growing demand and Socio-political factors such as marginalization and lack of social infrastructures like school and health facilities, improper waste disposal in areas that refugees positioned to live, the refugees and the host communities regularly are in conflicts. The relationship between limited(scarce) resources due to environmental degradation and socio-political factors such as marginalization and lack of social infrastructure and conflict or insecurity feels right. It looks intuitively right to anticipate a direct correlation between scarce resources due to environmental degradation and Socio-political factors such as marginalization and lack of social infrastructures like schools and health facilities, improper waste disposal on the one hand, and social disruption, environmental conflict, and insecurity on the other. i.e. there is a scarcity of availability of water, availability of energy, availability of seasonal building materials, availability of land, the excessive price of goods, marginalization, and lack of social infrastructure consequences in environmental conflicts and insecurity.

4.7. Nexus of environmental management by UNHCR and environmental security

4.7. 1 The interaction of environmental management and environmental security

The Nexus approach presents a conceptual approach to better understand and systematically analyses of the interactions between environment security, and integrated environmental management. So, in this topic explained the relationship, interdependence generally nexus that existed between environmental management and environmental security. “Nexus thinking highlights inter-linkages between environmental security, and integrated management and governance of these domains, across sectors and scales” (Wayne Foord,2016:1).

Environmental security “is the relative public safety from environmental dangers caused by natural or human processes due to ignorance, accident, mismanagement or design and originating within or across national borders”(Elsevier,2008:1352). In addition, this is also” the major challenge concerns the global environmental change, focusing on the interactions between ecosystems and mankind, the effects of global environmental change on environmental degradation, the effects of increasing social request for resources, ecosystem services, and environmental goods”(Elsevier,2008:1351).

Generally, the word environmental security refers to a variety of issues that can be geared up into three general categories:-Concerns about the negative effect of human actions on the environment, Concerns about the direct and indirect outcomes of various types of environmental change (especially shortage and degradation) which might also be herbal or human-generated on global,countrywide and regional security and Concerns about the insecurity person and population (from small communities to humankind) journey due to environmental change such as water scarcity, air pollution, global warming, and so on. Combining these we would possibly conclude that the situation of the environmental security is one in which social systems have interaction with ecological systems in sustainable ways, all people have honest and realistic get right of entry to environmental goods, and mechanisms exist to tackle environmental crises and conflicts.

Environmental insecurity (Water insecurity, energy insecurity, food insecurity and etc.) is dominantly the result of scarcity. “Scarcity, can come about in one of three ways: (i) as a result of increased demand (demand-induced), for example through population growth or increased per capita consumption; (ii) as a result of decreased supply (supply-induced), for example the erosion of cropland ; and/or (iii) as a result of unequal access to and distribution of a resource (structural) ‘that concentrates it in the hands of relatively few people while the remaining population suffers from serious shortages’ (Homer-Dixon, 1998: 280; Larry A. Swatuk,;2014:7). As a result, “environmental security has to do with risks or fragility (vulnerability) of losing ecosystem goods and services as well as the perception of those risks. Thus, fragility is deemed multilayered, multiscale, and complex, existing in both the objective physical and social realms, as well as in the subjective realm. Often it exists because of the choices we make” (Elsevier ,2008:1353). consequence of this, environmental security involves “the maintenance of the physical surroundings of society for its needs without diminishing the natural stock” (Elsevier ,2008;1352). and it is also protection of natural environment and vital interests of citizens, society, the state from internal and external impacts, adverse processes and trends in development that threaten human health, biodiversity and sustainable functioning of ecosystems, and survival of humankind. Therefore, to fulfil this, there should be efficient and effective environmental management.

On the other hand , Environmental resource management is “the management of the interaction and impact of human societies on the environment. It is not, as the phrase might suggest, the management of the environment itself. Environmental resources management aims to ensure that ecosystem services are protected and maintained for future human generations, and also maintain ecosystem integrity through considering ethical, economic, and scientific variables. Environmental resource management tries to identify factors affected by conflicts that arise between meeting needs and protecting resources” (Jubaer run,2018:5). furthermore, it refers to the sustainable utilization of most important natural resources, such as land, water, air, minerals, forests, fisheries, and wild flora and fauna. Together, these resources supply the ecosystem services that grant the best and excellent to human life. Natural resources give essential life support, in the form of all consumptive and public-good services. Ecological procedures preserve soil productivity, nutrient recycling, the cleaning of air and water, and climatic cycles.

Now a days in and around refugee camps like Tierkidi “Participatory Environmental Management in the environmental conflict is growing UNHCR has been testing the performance of participatory forms of environmental management for conflict resolution or sustainable environmental security. For example, some success is reported from the Refugee-affected Areas Rehabilitation Programmed in Nepal” (UNHCR,1998:1). Most recently, “UNHCR has commissioned the development of methods for participatory environmental management (PEM) in order to support the FRAME programmed. FRAME is a three-pillared approach to managing the environment, based on assessment, monitoring and evaluation processes. It is intended that community participation will eventually permeate all three processes, partly to improve the effectiveness of environmental management, but equally as a strategy for alleviating refugee– host conflict and maintain environmental security. It is hoped that forms of ecomanagement of resources, involving both refugee and host communities, can foster perceptions of mutuality that relieve the propensity of resource use competition to heighten consciousness of ethnic divisions, inequality and other triggers of violence” (Adrian Martina,2005:339).

“Managing conflicts that are related to natural resources is now more critical than ever before. As economic and population growth increase levels of global consumption, many countries face growing shortages of vital renewable resources such as freshwater, cropland, rangeland, forests, fisheries and other wildlife. Depletion of renewable natural resources, combined with

environmental degradation and climate change, pose fundamental threats to environmental security in particular and human security in general. Separately or in combination with other factors, they can destabilize livelihoods, negatively affect ecosystems and undermine peace and development” (UNEP,2012:8). Consequently, natural resource management matters have attracted growing interest in the current decades, especially in and around refugee camps like Tierkidi. partly in response to a sequence of crises in energy, food, water, and other different resources. Effective governance and management of natural resource have usually been important, however, have grown to be increasingly more difficulties in the face of environmental degradation, livelihoods, and market pressures. Many refugee camps like the study area; have compromised their herbal resource base for the sake of fulfilling the desires of all refugee and host communities, and are subsequently dealing with a number of environmental challenges. The stress on herbal resources has probably been aggravated through mismanagement and unplanned use of the resource because of refugees and the host community. Under such circumstances, the high-quality of land, water, and the forest are threatened, and the regenerating ability of resources is infrequently guaranteed. The haphazard use and the conflicts overuse of herbal resources pose serious threats to the viability and sustainability of the herbal resources in and around refugee camps like Tierkidi. These conflicts over natural resources are mostly because of fueled and elevated inter-ethnic tensions and struggles.

When mechanisms for managing and resolving rivalry in the degraded resource break down, the conflict will become escalated and complicated and can also give way to violence. Weak institutions, lack of peace, and divisive social interaction can perpetuate cycles of violent conflict. However, disputes and grievances over herbal resources can make a contribution to violent conflict when they overlap with other different factors, such as ethnic polarization, excessive degrees of inequity, poverty, injustice, and bad governance generally poor management. “Conflict itself is not a negative phenomenon; indeed, well-managed conflict can be an essential component of social change, democracy and development. However, where local and national institutions lack the capacity to resolve disputes over the degradation or depletion of natural resources, violent conflicts can and do emerge” (UNEP,2012:8).

Consequently, natural resource management matters have attracted huge interest in the current decades, especially in and around refugee camps like Tierkidi. partly in response to a sequence

of crises in energy, food, water, and other different resources. Effective governance and management of resources have usually been important; however, they have emerged as more and more difficult in the face of environmental degradation, livelihoods, and market pressures. Many refugee camps like the study area; have compromised their natural resource base for the sake of fulfilling the wishes of each refugee and host communities, and are therefore going through a range of environmental challenges. The stress on natural resources has probably been aggravated with the aid of mismanagement and unplanned use of the resource because of refugees and the host community. Under such circumstances, poor and ineffective institutions to have an effect on natural resource management policies/laws and rules at the decrease levels have created greater resource conflicts. When natural resources are poorly managed, inequitably shared, or when operations are applied without due consideration for the environmental context and communities, tensions may emerge that can boost into violent conflict or feed into and exacerbate pre-existing conflict dynamics this negatively affects environmental security.

Scarce natural resource conflicts of interest are an inevitable characteristic of all societies. In the latest years, the scope and magnitude of natural resource conflicts have expanded and intensified especially in and around refugee camps. Natural resource conflicts are disagreements and disputes over access to, and manage and use, scarce herbal resources such as forests, water, pastures, and land. Disagreements of refugee and host communities in the refugee camps like Tierkidi besides occur when these pursuits and desires are incompatible due to scarce resources, or when the priorities of some consumer communities are not regarded in policies, programs, or projects. In addition, lack of environmental impact assessments, lack of contingency planning, consumer communities are excluded from taking part in natural resource management, the whole failure of built-in environmental resource management in and around refugee camps like Tierkidi. These conflicts, if not addressed, can expand into violence, reason for extra environmental degradation, disrupt projects, and undermine livelihoods, and finally, it is a problem for fruit full environmental management. Thus, this environmental management failure contributes to environmental insecurity or low or week environmental security in and around Tierkidi refugee camp. Under other different condition, environmental insecurity that is energy insecurity, water insecurity, food insecurity, and waste disposal problem, due to environmental insecurity, conflicts and violence between refugee and host community are escalated, health problem and community catastrophe problems increases, etc. This situation grew to be a massive

challenge for environmental management. The environment is higher protected in the absence of conflict and in the presence of stable condition.

On the other hand, whilst competing interests over natural resources can be a source of conflict, they can equally be a shared possibility for cooperation, confidence-building, and sustainable development. Understanding how to radically change conflicts over natural resources into mutually beneficial results that deepen confidence and inter-dependence between parties is a key purpose of tremendous environmental protection or mitigation, efficient environmental management strategies. Such efforts have to center of attention on mitigating degraded natural resources and protecting the existing resource building consensus and mutual trust around the management of natural resources and the environment, identifying equitable sharing of benefits and resolving disputes in non-violent ways.

Good governance and sound equitable natural resource management are central to safeguarding peace, development, and environmental security in and around refugee camps like Tierkidi. Where appropriate governance is present, corruption and insecurity are always minimal and resource management is probably to be good and coupled with sound social protection activities that minimize vulnerability to environmental degradation (apply effective integrated environmental management). This effects in high or strong environmental security in refugee camps like the study area. This high or strong environmental security makes a favorable situation for environmental management.

Finally, environmental management and environmental security are positively correlated i.e. effective environmental management such as land management, integrated water resource management (IWRM), Integrated forest management (IFM), proper waste management and Integrating natural resource issues in peace negotiations are fundamental to high or strong environmental security and strong or high environmental security is making a favorable condition for environmental management.

4.7.2. The future scenarios of the nexus of environmental management and environmental security in the study area.

This section explores two broad scenarios for the nexus of environmental management and environmental security in Tierkidi refugee camp. first, environmental degradation continues at a gradual pace, whereas in the second it occurs rapidly, precipitating a sense of crisis.

4.7.2.1 Optimistic scenario (Gradual Environmental degradation)

The optimistic scenario is Assuming that environmental change proceeds gradually, I can anticipate several interrelated trends: a progressive strengthening of existing international institutions such as UNHCR and its partners, the increasing trans nationalization of environmental governance, and greater integration of environmental consideration, human rights, and development policies, UNHCR holistic policy towards environment management. Moreover political instability in both south Sudan and Sudan became stable (the negotiation between the government and the opposition became fruit full and form joint permanent government in south Sudan and Sudan government became strong) due to this political stability in two countries results low new arrivals of refugees and makes favorable condition for the refugee back to their homeland and decrease population pressure, in Tierkidi refugee camp. consequently, it is possible to apply effective integrated environmental management, that is planned and effective mitigation measures in the study area.

One key measure to slowing the pace of environmental degradation is the early adoption of precautionary measures, no-regrets and other win-win policies, and responses that address the underlying causes of environmental degradation. “UNHCR’s environmental policy deals with refugee-related environmental problems during all phases of refugee assistance, i.e.(a) the emergency phase, (b) the care-and-maintenance phase, (c) the durable-solutions phase” (UNHCR,1996:6). Measures , “dealing with food, procurement, domestic energy needs, water, sanitation, health/nutrition, physical planning/shelter, agriculture, livestock/animal husbandry, forestry, and income generation by promotion of environmentally friendly procurement, policy level coordination, promotion of environmentally friendly technologies, upgrading of the environmental data base, environmental training, consideration of the environment in contingency plans, coordination, post-emergency assessment, physical planning , environmental planning, environmental programming, local settlement , environment concerns in relation to repatriation and effective reintegration, rehabilitation” (UNHCR 1996:13-25). In addition to this UNHCR needs a holistic up to date policy and it should work with government of the host country ,other united nations bodies ,NGOs and other stake holders this is “because international environmental problems can be addressed only through collective action, enhanced cooperation at all levels of social organization is the most likely scenario for the coming century” (Karen T. Litfin, 1999:372).

One important mechanism for slowing the pace of environmental degradation is the adoption of "no-regrets" policies that would make sense even in the absence of environmental threats—for example, increased reliance on clean and efficient energy sources. UNHCR and its partners need to prioritize sustainable energy as well as initiatives linked to waste production, poaching, and land erosion, in order to better protect the environment UNHCR need to ensure that it have the right staff, with sufficient resources to implement programs which both support the refugee and host communities, which in turn strengthens the overall protection environment.in the study area.

It is a vision of “green” refugee camps, the place where humans do not consume wood in excess of what they grow or can be renewed; where they earn income from restoring fundamental ecosystem services that have been before faltering. Where trees, bushes and shrubs are used for fruit and to stabilize the soil close to waterways and protect erosion. In this vision of a “green” refugee camp, humans gather water and reuse it, use solar energy and wind generators as an alternative of firewood and diesel generators. Green areas in the camp grant locations with shade and a sense of community. Sanitation amenities are set up smartly, to keep away from polluting and even enable waste to be a section of the energy solution.

Community awareness about energy and the environment is efficiently disseminated as everybody has connectivity and it is a core module in an improved gaining knowledge of environment. Shelters are constructed to appropriately insulate in summer and winter. Where possible, refugees are capable to increase products for their personal use and sale. This successful environmental management resulted in high or strong water security, food security, energy security and effective management of waste disposal and excellent health conditions results no or much less environmental conflicts consequently results in high and strong environment security.

4.7.2.2 Pessimistic scenario (Catastrophic Environmental degradation)

Since climate impacts for all intents and purposes each part of worldwide nature, atmosphere shakiness is presumably the absolute in all likelihood wellspring of disastrous ecological corruption in the coming century. “The impact on international social and political order could be tremendous. Scientists predict that global warming, will increase the spread of infectious diseases and agricultural pests; aggravate the loss of biodiversity; greatly intensify weather extremes, including floods and droughts; and lead to a global decline of food supply from land

and water” (Karen T. Litfin,1999:373). It is conceivable, in any case, that crises could create because of environmental degradation that may light vicious violent conflict or coercive reaction. Similarly, the social reverberations of catastrophic environmental degradation could exacerbate existing ethnic and class conflicts.

“There is a real danger that environmental security in the next century could take on the more noxious us-versus-them tone of national security discourse during the Cold War. Rather than the integrity of ecosystems or the well-being of humanity becoming the objects to be secured, consumption would become the object of security. "Environmental security" would become a speech act uttered by the haves against the have-nots”(Karen T.Litfin,1999:373). The refugee camp areas are generally environmentally degraded regions. As the population increase due to the fact of the inflow of refugees and natural growth in and around the refugee camp, the stress on environmental resources is hastily intensifying. Invariably, environmental security in the refugee camp is poor/weak or insecure. The quickest enlarge in natural resource demand in and around the Tierkidi refugee camp causes water insecurity, energy insecurity, food insecurity health problem, and unplanned waste disposal.

The pessimistic scenario is that with poor and bad environmental management excessive inflow of refugee due to the fact of the political instability such as the continuation of civil war in south Sudan and Sudan continuous its fragility and instability and a large number of new arrivals will come to Tierkidi refugee camp, as a result, the population grew to be large in quantity and stayed for a long duration of time, causes severely degraded environment, and results extra stress on already scarce resources. consequently, will minimize the availability of water, energy, food, poor health and improper waste disposal, furthermore specifically if integrated with rising natural resource demand, enlarge the propensity for environmental-related conflicts between the refugee and host community due to the fact that a scarce resource consequently results in weak environmental security (environmental insecurity). This weak or low environmental security or environmental insecurity will face a notable problem or challenge to environmental management in the Tierkidi refugee camp.

In general, the potentialities are much brighter in the first scenario; interrelated environmental management will apply, a wider variety of innovative policies and strategies alternatives will present themselves; current organizations can proceed to evolve, political stability neighboring

nations much less population stress to the study area and violent conflict will be much less likely, subsequently high or strong environmental security sustained. On the other hand in the second cases, the enlarge of inflow of the refugee in around Tierkidi refugee camp due to political instability such as the continuation of civil war specially in south Sudan and environmental problems such as drought in neighboring nations specifically South Sudan increase populace pressure in the study area with poor or bad environmental management causes catastrophic environmental degradation which will increase competition and conflicts between refugees and host community over scares natural resources and results more stress on already scarce resources. as a result, water insecurity, energy insecurity, food insecurity, high prices of goods, inappropriate waste disposal, etc., usually low or week environmental security (environmental insecurity) will continue in Tierkidi refugee camp.

4.8 .Conclusions

Based on the findings , it can be concluded that there is insufficient information regarding the negative impact of refugees and host community and its impact on environmental security; the nexus between environmental management of UNHCR and environmental security in and around Tierkidi refugee camp. Obviously, we may expect that large-scale refugee movements cause environmental problems, at least in the short term. It is difficult to form a valid picture of environmental problems if no information is available on the state of the environment prior to the arrival of refugees in and around Tierkidi refugee camp. Environmental degradation in and around Tierkidi refugee camp resulted because of both refugee and host community, although it is mainly caused by the refugees. Therefore, the environmental impacts of refugees affect the food security, water security, energy security and etc. Through deforestation, soil erosion and land degradation, unsustainable water extraction, and water pollution, which have both short-run and long-run effects. Consequently, the impact of environmental deterioration on the refugees themselves and host community is intense. Low-quality water affects the health of large numbers of people, in a situation where there is a high risk of infectious diseases multiplying rapidly. Deforestation gradually forces women and children to walk further for wood, putting women in particular in danger of physical assault. Children may have to miss school to help their families; cooking time is shortened, and drinking water not boiled. Refugees may have to sell part of their food rations in order to obtain the fuel needed to cook the remainder, contributing to increased levels of malnutrition.

Unfortunately, there is no single blueprint for managing the environment in situations of human displacement. Planners, managers and decision-makers hence need to be aware of the main environment-related issues, and their potential implications. Although UNHCR and its partners environmental mitigation or intervention programs in and around Tierkidi refugee camp; are very small in number of projects compared to UNHCR environmental programs listed in its guidelines of 1996 and 2005 and its coverage compared to the severity of the level and rate of environmental degradation of in the study area; there are Projects that address specific environmental activities such as tree planting, environmental awareness raising, promotion of fuel-efficient stoves, waste disposal and etc. activities have been practice. Thus, relatively reduced firewood collection in small amount, increased security for women and children in small degree ,a little bit reduces conflicts because of scarce resources between refugee and host communities, a little bit freed up time for children to attend school, and has had a positive impact on the natural environment in the study area in small degree.

In and around Tierkidi refugee camp, conflicts between refugees and host community are still frequent. Despite the implementation of various environmental management projects intended to prevent future degradation and rehabilitate already degraded areas, resource depletion and degradation is still a significant problem for both refugees and host community. That results low environmental security (environmental insecurity)

Environmental management and environmental security are positively correlated, i.e., effective environmental management such as land management, integrated water resource management (IWRM), Integrated forest management (IFM), proper waste management and Integrating natural resource issues in peace negotiations are vital to high or strong environmental security. On the other hand, strong or high environmental security is making a favorable condition for environmental management.

In general, the prospects are much brighter under the Optimistic scenario; integrated environmental management will apply, a wider range of creative policy options will present themselves; existing institutions can continue to evolve, political stability neighboring countries less population pressure to the study area and violent conflict will be less likely ,consequently high or strong environmental security sustained . In either case(pessimistic scenario), the increase of influx of refugee in around Tierkidi refugee camp because of political instability such

as continuation of civil war and environmental problem such as drought in neighboring countries especially South Sudan increase population pressure to the study area together with poor environmental management causes catastrophic environmental degradation which increases competition and conflicts between refugees and host community over scarce natural resources, and placing more pressure on already scarce resources. As a result, water insecurity, energy insecurity, food insecurity, high prices of goods, improper waste disposal etc., generally low or weak environmental security (environmental insecurity) will continue in tierkidi refugee camp.

However, there was often for environmental assessment conducted before the camp are established, environmental problems cannot be easily understood without taking detailed social, economic and political processes into account or without conducting environmental impact assessments (EIA).

In the third or durable-solutions phase, environmental degradation decreases because of :- refugee numbers are decreased due to of local integration, resettlement, and voluntary repatriation and other different intervention measures i.e., environmental education and use of alternative energy source, sustainable livelihood and life support,. And the refugees continuously in coordination with nature, this mode enables that load on the environment reduces constantly till to a lower degree. This process is indicating the Environmental Kuznets Curve (EKC), is applicable in the process of refugee movement, that is, the environmental conditions will first decline and then gradually improve.

Although UNHCR environmental management activities resulted some changes regarding to environmental conflicts and security, there are factors that negatively affect environmental security i.e.Limited (scarce) resource factors such as shortage of water, energy, building material, grazing land, and high goods prices b/c of increasing demand and Socio -political factors such as marginalization and shortage of social infrastructure.

4.9. Recommendations

The following recommendations are proposed by the researcher based on the findings from this study.

1. There was no detailed Camp site selection process and environmental impact assessment(EIA) in the initial stages i.e. primarily environmental considerations by protecting water sources and providing adequate sanitation, and limiting the size of the refugee to be settled and the corresponding availability of water, land, vegetation and to the refugee - host community in and around tierkidi refugee camp. So that there should be effective corrective measure like decreasing the number of refugees to the standard etc. (see Appendix -1 below)
2. There should be increased awareness raising avenues on environmental education towards the refugees, host communities and governmental and non-governmental expertise and officials. And increase budget for environmental management (mitigation)activities, income generating activities, and alternative building material in and around tierkidi refugee camp.
3. There should be effective and fruitfull coordination among different stakeholders and avoiding fragmented environmental bureaucracy, enhancing participatory planning and implementation system, improved environmental technologies, skills of staffs and hired sufficient expertise for environmental management(mitigation)activities in and around tierkidi refugee camp.
4. There should be effective actions or measures to be taken to come in to being Optimistic scenario i.e. Integrated environmental management will apply, a wider range of creative policy options will present, and reducing environmental conflicts and securities consequently high or strong environmental security sustained in and around tierkidi refugee camp.
5. There should be full and effective implementation of UNHCR environmental mitigation progammes that equally benefited for both refugee and host community's based on environmental problems that existed in and around Tierkidi refugee camp.
6. There should be continuous and participatory conflict resolution measures or dialogue mechanism between refugee and locals to make high or strong environmental security .

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ppendix -1 Some issues, implications and suggested norms regarding the environmental considerations of site selection

Issues	Potential implication	Some suggested norms
Pop. density of refugees	High population densities have a greater impact on the environment	Camp population should not exceed 20 000 people
Population density of local communities	If the host community is overwhelmed by the number of refugees, local rules and access to resources may be negatively affected	Local population should not be in extreme minority vis-à-vis the number of people arriving/being settled
Camp layout	Many design elements can have major impacts on the environment, e.g. housing arrangements or the location of water points or roads	Clustered layout can facilitate shared cooking; adequate water points (maximum of 250 people per tap stand); maximum of 20 people per latrine
Household plot size	Larger plot sizes will enable families to become more self-sufficient	200-300 m ² is the recommended plot size per family or household
Reliable access to safe drinking water	If people do not have access to adequate safe water, they may be forced to collect this from streams or other sources	Each person should have access to 15 litres of water per day; dwellings should not be more than 100 m or a few minutes' walk from water points
Sanitation	If the groundwater table is high (even through seasonal fluctuation) contamination is a risk	Latrines should be located at least 30 m from water points and the bottom of the latrine pit should be a minimum of 1.5 m above the water table
Slope	Water drainage and flooding; soil erosion; excessive water run-off	The site should be above flood-prone areas, preferably on gentle (2 to 4 %) slopes. Avoid flat areas and those with a slope of more than 10 degrees
Avoid areas prone to flooding	Loss of life; loss of shelter; disease transmission	Check slopes, drainage rates and groundwater absorption rates. Also determine whether the water table fluctuates seasonally
Accessibility	Inaccessible sites will be cut off during periods of heavy rainfall	Sites should permit year-round access for delivery of provisions and supplies
Proximity to village or other camp	Environmental (and other) impacts will be greater on account of population pressure	At least 15 km between camps
Ecologically sensitive site	Loss of biological diversity; damage to ecosystem functioning (e.g. absorption of rainfall and retention of groundwater)	Camps should be at least 15 km from a site of ecological importance (international, national or local). If this cannot be observed, additional protection/negotiation measures may be required

Land quality	Land on the household plot should ideally be suitable for growing limited amounts of crops	A soil survey should be carried out and the results used to influence camp selection and eventual layout
Natural or manmade hazards	Flooding, fire, pollution	The site should not be within reach of a natural hazard (e.g. a volcano) or easily identifiable potential man-made hazard (e.g. a large dam)
Availability of natural resources	Displaced people may rely heavily on resources such as fuelwood or wild game an abundance of natural resources (and lack of protection) may encourage accelerated depletion for income generation	Access to and use of natural resources should be regulated
Waste management	The terrain may not allow for safe disposal of solid waste	Dwellings should be more than 15 m from a waste container or household pit and 100 m from a communal pit. Safe waste disposal sites must be identified (consider impacts on groundwater and the local community) for additional waste

Source united nation environmental program (UNEP),2006,26

Appendix -2. Accuracy Assessment for the 2020 Lu/Lc Classification in Tierkidi Refugee Camp, Etang Especial Zone

		Land use/Land cover (Field Observed)														User Accuracy	
		Water body		Woodland		Grassland		Bareland		Cropland		Rural Settlement		Rural Town			
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Lu/Lc (office interpreted)	Water body	10	8.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	10	####
	Woodland	1	0.8	20	16.9	1	0.8	0	0	0	0.0	0	0.0	0	0.0	22	90.9
	Grassland	0	0.0	1	0.8	15	12.7	0	0.0	1	0.8	1	0.8	0	0.0	18	83.3
	Bareland	1	0.8	0	0.0	1	0.8	15	12.7	2	1.7	0	0.0	0	0.0	19	78.9
	Cropland	0	0.0	0	0.0	0	0.0	1	0.8	15	12.7	0	0.0	0	0.0	16	93.8
	Rural Settlement	0	0.0	0	0.0	0	0.0	1	0.8	0	0.0	20	16.9	1	0.8	22	90.9
	Rural Town	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.8	10	8.5	11	90.9
Producer Accuracy		12	83.3	21	95.2	17	88.2	17	88.2	18	83.3	22	90.9	11	90.9	118	63.6

Overall accuracy: 89%

Symmetric Measures

		Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Measure of Agreement	Kappa	.858	.084	####	.000
N of Valid Cases		46			

Source: Visual Interpretation was applied to classify the images into Lu/Lc classes listed above using Arc GIS ver 17.)

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Very high-resolution imagery and some GPS points (collected in the field from each lu/lc classes) were used to assess the accuracy the classification based on Kappa Index of agreement and confusion matrix.

Appendix -3. Land use/Land cover change matrix in Tierkidi Refugee Camp and the Surrounding Area, Etang Especial Zon during the period 2013 - 2020

Lu/Lc type	Water body		Woodland		Grassland		Bareland		Cropland		Rural Settlement		Rural Town		Total	
	Ha.	%	Ha.	%	Ha.	%	Ha.	%	Ha.	%	Ha.	%	Ha.	%	Ha.	%
Water body	486	61.5	71	0.3	71	0.5	0	0.0	7	0.1	0	0.0	0	0.0	635	1.3
Woodland	2	0.3	920	36.5	370	26.8	195	33.0	2329	36.0	11	8.5	0	0.0	1544	32.8
Grassland	282	35.7	869	34.5	716	51.2	249	42.2	1594	24.6	7	5.2	0	0.3	1799	38.3
Bareland	4	0.5	157	6.2	116	8.4	43	7.3	519	8.0	0	0.0	0	0.0	3302	7.0
Cropland	13	1.6	482	19.2	155	11.6	103	17.3	1811	28.0	48	36.4	0	0.0	8357	17.8
Rural Settlement	0	0.0	806	3.2	148	1.1	0	0.0	215	3.3	5	3.8	0	0.0	1174	2.5
Rural Town	3	0.4	3	0.0	2	0.0	0	0.0	0	0.0	61	46.0	53	99.7	122	0.3
Total	790	100	25175	100	13808	100	5900	100	6475	100	132	100	530	100	47023	100

Source: Visual Interpretation was applied to classify the images into Lu/Lc classes listed above using Arc GIS ver 17.)

Appendix -4a. Land use/Land cover change during 2013 - 2020

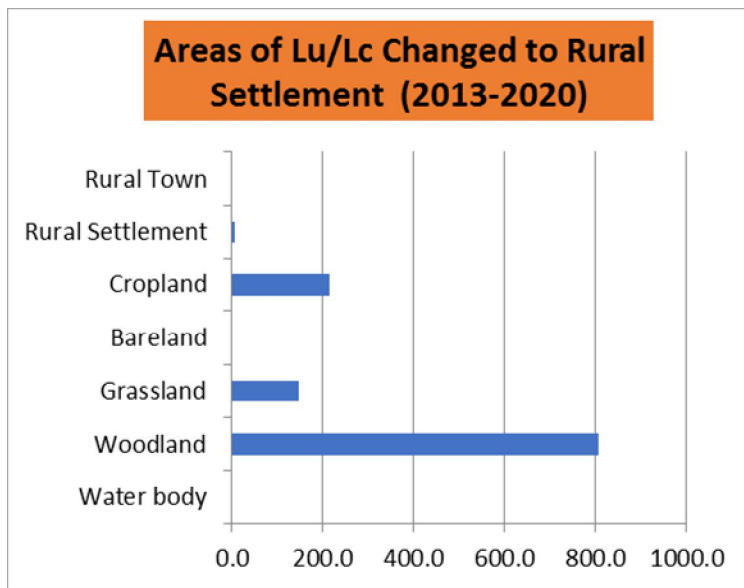
Lu/Lc Type	Persistence		Gains		Losses		Net Change	
	Ha	%	Gains (ha)	%	Losses (ha)	%	Ha	%
Water body	485.6	61.5	149.2	0.552	-304.3	-1.1	-155.1	-0.5
Woodland	9200.0	36.5	6243.9	23.1	-15974.5	56.8	9730.7	33.7
Grassland	7162.0	51.9	10828.5	40.07	-6646.3	23.6	4182.2	16.4
Bareland	42.9	7.3	3258.9	12.1	-547.4	-1.9	2711.5	10.1
Cropland	1810.9	28.0	6545.6	24.2	4664.0	16.6	1881.6	7.6
Rural Settlement	5.1	3.8	1168.5	4.3	-126.7	-0.5	1041.7	3.9
Rural Town	53.1	0.0	68.9	0.3	-0.2	0.0	68.7	0.3
Total	18759.5	39.89	27026.1	100	-28136.5	-100	1110.5	0.0

Source: Visual Interpretation was applied to classify the images into Lu/Lc classes listed above using Arc GIS ver 17./calculated 2020

Appendix -5 Land use categories Changed to Rural Settlement (2013-->2020)

Area

Lu/Lc Type	Ha	%
Water body	0.0	0.0
Woodland	805.7	68.7
Grassland	147.8	12.6
Bareland	0.0	0.0
Cropland	214.9	18.3
Rural Settlement	5.1	0.4
Rural Town	0.0	0.0
Total	1173.5	100.0



Source: Visual Interpretation was applied to classify the images into Lu/Lc classes listed above using Arc GIS ver 17./calculated 2020

Appendix -6. Land use/Land cover change matrix in Tierkidi Refugee Camp and the Surrounding Area, Etang Especial Zon during the period 2001 - 2020

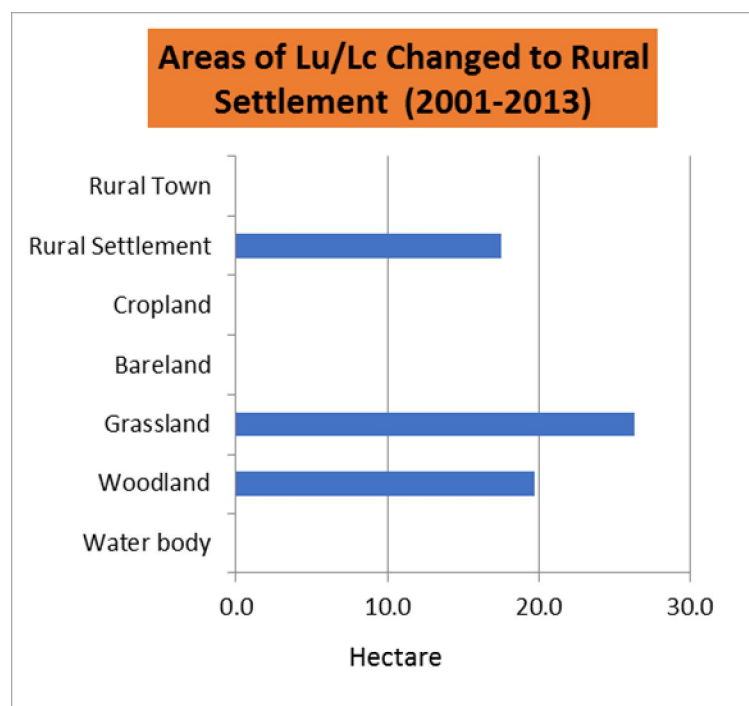
Lu/Lc type	Lu/Lc Types 2001															
	Water body		Woodland		Grassland		Bareland		Cropland		Rural Settlement		Rural Town		Total	
	Ha.	%	Ha.	%	Ha.	%	Ha.	%	Ha.	%	Ha.	%	Ha.	%	Ha.	%
Water body	483	54.4	85	0.3	66	0.4	0	0.0	0	0.0	0	0.0	0	0.0	635	1.3
Woodland	5	0.6	7571	29.1	6328	37.0	1024	69.0	511	34.9	6	20.0	0	0.0	15444	32.8
Grassland	384	43.3	10542	40.5	6263	36.6	226	15.3	563	38.4	9	33.4	2	8.1	17991	38.3
Bareland	0	0.0	1975	7.6	1223	7.1	88	5.9	16	1.1	0	0.0	0	0.0	3302	7.0
Cropland	16	1.8	4987	19.2	2915	17.0	52	3.5	375	25.6	12	42.2	0	0.0	8357	17.8
Rural Settlement	0	0.0	864	3.3	274	1.6	35	2.3	0	0.0	1	3.4	0	0.0	1174	2.5
Rural Town	0	0.0	0	0.0	43	0.3	59	3.9	0	0.0	0	1.1	20	91.9	122	0.3
Total	888	100	26025	100	17113	100	1484	100	1465	100	28	100	21	100	47023	100

Lu/Lc types 2020

Appendix 7. Land use/Land cover change during 2001 - 2013

Lu/Lc Type	Persistence		Gains		Losses		Net Change	
	Ha	%	Gains (ha)	%	Losses (ha)	%	Ha	%
Water body	630.7	71.0	159.2	0.726	-257.4	-1.1	-98.2	-0.4
Woodland	17157.0	65.9	7886.8	35.98	-8867.9	-39.3	-981.1	-3.4
Grassland	5860.3	34.2	7598.7	34.67	-11252.6	-49.9	3653.9	15.3
Bareland	45.6	3.1	544.7	2.5	-1438.1	-6.4	-893.4	-3.9
Cropland	744.1	50.8	5730.8	26.1	-720.4	-3.2	5010.4	22.9
Rural Settlement	17.5	63.0	46.0	0.2	-10.3	0.0	35.6	0.2
Rural Town	21.4	0.0	580.6	2.6	0.0	0.0	580.6	2.6
Total	24476.7	52.05	21920.2	100	-22536.4	-100	-616.2	0.0

Appendix 8



Appendix 8. Percentages of Land use/Land cover in Tierkidi Refugee Camp, itang Especial Woreda, during the period 2001 - 2020

Lu/Lc type	2001		2013		2020		Change 2001-2013		Change 2013-2020		Change 2001 - 2020	
	Ha.	%	Ha.	%	Ha.	%	Ha.	%	Ha.	%	Ha.	%
Waterbody	888	1.9	790	1.7	635	1.3	-98	-11.1	-155	-19.6	-253	-28.5
Woodland	2602 5	55. 3	2517 5	53. 5	1544 4	32. 8	-850	-3.3	973 1	-38.7	1058 1	-40.7
Grassland	1711 3	36. 4	1380 8	29. 4	1799 1	38. 3	330 5	-19.3	418 2	30.3	878	5.1
Bareland	1484	3.2	590	1.3	3302	7.0	-893	-60.2	271 2	459. 4	1818	122.5
Cropland	1465	3.1	6475	13. 8	8357	17. 8	501 0	342. 1	188 2	29.1	6892	470.6
Rural Settlement	28	0.1	132	0.3	1174	2.5	104	373. 2	104 2	790. 5	1146	4113. 7
Rural Town	21	0.0	53	0.1	122	0.3	32	149. 1	69	129. 1	101	470.6
Total 1986	4702 3	100	4702 3	100	4702 3	100	0	0.0	0	0.0	0	0.0

Appendix 9: review of respondents

Resp. number	Status of respondents	Date of interview	nationality	sex
1	Environmental expert	6 April 2020	Ethiopian	M
2	Local community	23 march 2020	Ethiopian	M
3	Local community	23 march 20220	Ethiopian	F
4	local community	23 march 20220	Ethiopian	M
5	Environmental expert	7 April 2020	Ethiopian	M
6	Environmental expert	7 April 2020	Ethiopian	M
7	Environmental expert	8 April 2020	Ethiopia	F
8	Environmental officer	07 February, 2020	Ethiopian	M
9	Environmental expert	08 April 2020	Ethiopian	F
10	Environmental expert	9 April 2020	Ethiopian	F
11	Environmental officer	07 February, 2020	Ethiopian	M
12	Environmental expert	09 April 2020	Ethiopian	M
13	Forest Gard	23 march 2020	Ethiopian	M
14	Refugee	24 March 2020	South Sudanese	F
15	Forest Gard	23 march 2020	Ethiopian	M
16	Environmental expert	6 April 2020	Ethiopian	M
17	Refugee	23 march 2020	South Sudanese	F
18	6.Refugee	23 march 2020	South Sudanese	M
19	Refugee	23 march 2020	South Sudanese	F
20	Environmental expert	9 April 2020	Ethiopian	M
21	Environmental officer	07 February, 2020	Ethiopian	M
22	Environmental expert	9 April 2020	Ethiopian	M
23	Environmental expert	9 April 2020	Ethiopian	F
24	Environmental expert	7 April 2020	Ethiopian	M
25	Environmental officer	18 February 2020	Ethiopian	M
26	Environmental officer	19 February 2020	Ethiopian	M
27	Environmental expert	17 February 2020	Ethiopian	F
28	Environmental officer	17 February 2020	Ethiopian	M
29	Environmental officer	18 February 2020	Ethiopian	M
30	Environmental officer	19 February 2020	Ethiopian	M
31	Environmental officers	17 February 2020	Ethiopian	M
32	Environmental officers	17 February 2020	Ethiopian	M
33	Environmental officers	7 April 2020	Ethiopian	F
34	Environmental officers	9 April 2020	Ethiopian	F
35	Environmental expert	8 April 2020	Ethiopian	F
36	Environmental expert	8 April 2020	Ethiopian	M
37	Environmental expert	8 April 2020	Ethiopian	F
38	Environmental expert	8 April 2020	Ethiopian	F
39	Environmental expert	6 April 2020	Ethiopian	M
40	Environmental expert	6 April 2020	Ethiopian	M
41	Environmental expert	6 April 2020	Ethiopian	F
42	Environmental expert	7 April 2020	Ethiopian	M
43	Environmental expert	7 April 2020	Ethiopian	M
44	Environmental expert	7 April 2020	Ethiopian	F