

**IMPACTS OF HUMAN DISPLACEMENT BY WAR ON THE ENVIRONMENT  
OF BORTOWN, JONGLEI STATE, SOUTHERN SUDAN**

**BY**

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**DISSERTATION SUBMITTED TO THE DEPARTMENT OF ENVIRONMENT IN  
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR AWARD OF A  
BACHELOR OF SCIENCE DEGREE IN ENVIRONMENTAL  
MANAGEMENT OF KAMPALA INTERNATIONAL**

**UNIVERSITY**

**AUGUST 2008**

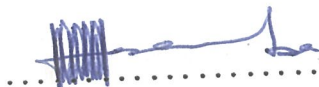
## DECLARATON

I, Mr. Yuot Diing John, declare that the content of this dissertation is the outcome of my own research basing on the stated topic. It has never been submitted in any university for the award of a degree.

Student signature

 .....

Signature of the supervisor

 .....

2.9.2008

## DEDICATION

I dedicate this dissertation to my mum Awak Ajang Duot and father Yuot Kuir Diing for exhibiting their wise support toward my academic progress. I should not forget to mention my brothers; Deng, Kuir, Bul and sisters Adut, Nyuon, Adhieu and Athieng for their best wishes during my studies.

## ACKNOWLEDGEMENT

I am indebted to my parents for their financial support towards my academic progress right from my primary studies to university. I should also mention the moral support besides financial support which enables me to fully focus towards my academic excellence.

I appreciated the holistic developmental services imparted in me by my lecturers particularly Dr. Twaha who taught me the Research Method as course unit which gave me the skills and knowledge on how to carry out scientific research. Dr. Twaha deserves much thanks for his professional guidance.

I recognize Mr. Deng John and Awuol Chan Awuol for being good throughout my study period. I appreciate the accommodation and computer given to me during this work.

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ACRONYMNS

ADRA	Adventist Development ACRONYMNS
ADRA	Adventist Development Relief Agency
CARE	Carry America Relief Everywhere
CRS	Catholic Relief Services
CSOPNU	Civil Society Organization for Peace in Northern Uganda Relief Agency
FAO	Food Agriculture Organization
IDP	Internal Displace Persons
ISF	Medicine San Frontiers
HO	Polish for Humanitarian Organization
PLA	Sudan People Liberation Army
PLM	Sudan People Liberation Movement
NOPS	United Nation Organization Projects
NICEF	United Nation Children Fund
NDP	United Nation Development Programme
FP	World Food Programme.
	Peace winds Japan

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## ABSTRACT

The research on the impact of human displacement by war on the environment was conducted in Bor town, Jonglei state, southern Sudan. Major areas of interrogation were; forms of environmental degradation, its effects on the environment and remedies put in place to stop their prevalence. To get the insight of the existing various forms of environmental degradation, various methods like photographs, interviews, questionnaire and observation were used to collect data.

During study, the level of environmental degradation according to various forms of environmental degradation were exhibited as follows; deforestation 18.37%, poor sanitation 24.49%, poverty 08.16%, poor solid waste management 16.33%, flood occurrence 20.31% and pollution 12.24% with poor sanitation taking high percentage among all the various forms of environmental degradation in town.

The study reveals that the end results of the environmental degradation in town ranges from its negative impacts on health, education, water quantity and quality and agriculture.

The researcher found some measures put in place to stop the community in carrying out environmental degradation activities. This includes; construction of drainage system and public latrines, provision of food, intensification of town survey process and installation of motorized water pump systems.

The research finding came up with following recommendation; construction of landfills for proper solid waste disposal, decongestion, public awareness and environmental education in town to bring a positive change.

## **1.0 INTRODUCTION.**

### **1.1 Background**

“War is never an isolated act” (Clausewitz, 1831).The connection between social conflicts or any other forms of conflicts and environmental degradation can be put forward in three different dimensions. First, where there is a conflict, environmental destruction takes place as a result of it. Second, environmental destruction may itself bring about social-conflict and finally besides being the cause or the consequence of conflict, environmental destruction may in some cases add fuel to the flames of conflict.

According to the International Federation of Social Workers (IFSW, 2002), armed conflict continues to dominate the world landscape and is to be seen in many parts of the world. The loss of life to such conflicts is high, particularly children.

Bortown Jonglei state was a place where Sudan People Liberation Army (SPLA) fired the first bullet in 1983 when it rebelled against the Khartoum government. This became one single factor leading to degradation of the environment as it led to clearing of forest reserves by troops, intense bombing raid of civil targets, the scattering of land mines over wide areas and concentration of people in and around security hamlets-all are rapidly accelerating the deterioration of an already fragile ecology and rural economy, and the constant use of heavy weapons including MiG air craft carrying napalm and defoliant, policy of bush clearance of areas believed to be gorilla hide outs as well as high demand for fuel wood that reduced plant cover.

### **1.2 Problem statement**

Bortown as one of main town in southern Sudan is known for insurgency. In this circumstance, the link between conflict and famine became distinct where there is much more damage being done: the destruction of the environment, increased number of the refugees ,both internally displaced and in exile, the opportunity cost of government expenditure upon the weaponry of war, the number of war related or famine –related death due to diseases and immensely distractive effects of war upon the infrastructure such as roads ,hospitals, clinics, schools and other social services were curtailed or

closed. Similarly, commercial activities, trade and communication were disrupted. The population explosion therefore, resulted into various forms of degradation such as deforestation, poor sanitation, water shortage and their associated problems like disease and loss of biodiversity.

### **1.3 Objectives of the study**

#### **1.3.1 General objective**

- To find out the impacts of displaced persons on the environment of Bor town Jonglei state in Southern Sudan,

#### **1.3.2 Specific objectives**

- To find out the forms of environmental degradation that result from human displacement.
- To find out the effects of environmental degradation on socio economic activities.
- To find out measures being taken to reduce environmental degradation caused by human displacement by war.

### **1.4 Research questions**

What are the effects of war on the activities carried out in this area?

How has war impacted on the sectors of the economy?

What forms of environmental degradation have resulted from displacement of people by war?

What measures are put in place to reduce the impacts accruing from human displacement by war?

## CHAPTER TWO

### 2. 0 LITERATURE REVIEW

#### 2.1 Environmental degradation

Since the end of World War II, there have been 119 major wars (deaths of 1,000 or more per year) fought in sixty-five countries and territories, ( Sivard, 1985).

UNEP (1987) observed that, wars cause considerable environmental destruction. Even during peaceful period, the maintenance of military forces claims the use of natural resources such as fuels, materials and land for military installations. World military expenditure, which has been steadily increasing over the years, may be used as an indicator of such environmental stress, although the relationships are rather indirect and the amounts of truly relevant spending are not readily available. Government military spending includes training, housing, feeding, clothing, supplying and maintaining its army and providing it with weapons. When a country goes to war there is the cost of transporting its army to the battlefield, medical costs and the loss of human lives - skilled people. After the war there is the cost of cleaning up the pollution and rebuilding and repairing infrastructure. Military spending is a massive drain on a country. Money spent on the military would be spent on health, education and the environment.

Agent Orange was used in millions of liters during the Vietnam War between 1962 and 1971 to defoliate tropical forests to expose combatants and destroy crops to deprive peasants of their food supply. This destroyed 14% of South Vietnam's forest cover (US/Vietnam Friendship Association, 2001)

Weeks (March 2002) spelt out that the concentration of up to 40,000 rural people in one place can have dramatic effects on the surrounding environment and resources, particularly soil. In Southern Sudan, several camps are over 20,000 and many more are in the 10,000 and above range. Thirty-five camps were recorded and the total population given as 447,000 thousands. Average camp size according to data for mid 2000 presented by Weeks (March 2002) is 12,800 persons. Where rural population, cooking with fuel

wood and charcoal and wanting to grow crops to supplement their food rations, is concentrated in a small area, dramatic environmental degradation is to be expected. Around the outskirts of the camp, contamination from faecal material and urine must be massive. Most burnable vegetation with a 2 hour walking distance (7kms) must have been used. In fact, it is reported that in some places all trees, including fruit trees, have been cut down for fuel (Bett, and Ngategize. P (1990)

With no other economic activity, large numbers of people (perhaps 1% of the population, or 5000 people) must engage in making charcoal and cutting firewood for sale each using about 5 hectares per year over the 16 years of conflict. All land within 8-10 kms that is suitable for agriculture must be being farmed, with fallow periods, if not being skipped entirely, reduced to a year or so. (CSOPNU, 2002).

The expansion of towns and cities accelerate soil degradation which causes serious impact on watershed areas resulting in sedimentation, contamination and disruption of water flows as well as increase in dumping of sewage and industrial wastes. The growing numbers of people especially the refugees suffering from insecurity with poor waste management which increases the discharge of wastes into water bodies, causing eutrophication (Akatch, 1996).

Losses related to agriculture and livestock which are the mainstay of the region are equal to the proportion of costs related to military expenditure. Tourism has suffered significantly as gun-shy tourists choose to other destinations instead of Sudan. (Nafissa, 2001).

Dorsey and Opeitum (2002) observed that, war has an incalculable lost of life and it spills over to other regions since it knows no geographic bounds. In Uganda, over 10% of public health problem relate to war.

(Berhe, 2007) Estimated that, there are between 60 and 110 million landmines in the ground worldwide. Over 26,000 people are injured or killed by landmines annually and even greater numbers of domestic and wild animals are killed. The consequences of landmines are felt years after hostilities cease. As well as the human casualties,



landmines are a significant contributor to such global environmental crises as deforestation, soil erosion, water pollution and declining biodiversity. Landmines cause physical and emotional injuries, destroy communities, and prevent reconstruction, access to safe water and the return of displaced persons to their homes. They also render fertile farmland unusable, creating food shortages and malnutrition. Wildlife and livestock is a common casualty of landmine explosions. There have been reports of antelopes and elephants killed by landmines during the civil war in Angola. Elephants have also been killed by landmines planted along the border between Burma and Bangladesh. Brown bears were killed by landmines in Bosnia and Croatia. Native tigers are threatened by landmines in Cambodia. In Tibet, rare species of clouded leopard, barking deer, snow leopard and Royal Bengal tiger have been reported as casualties of landmines – either maimed or killed. In the Congo Democratic Republic, rebel forces tested some fields for the presence of landmines by herding cattle across them. The presence of mines denies farmers and villager's access to natural resources, and this drives them into more marginal and fragile environments. Forests often become the only source of fuel and food, and the resulting depletion of resources leads to deforestation and the destruction of biological diversity. When people are driven off their most productive agricultural land they may be forced to depend on a smaller area of land to survive or earn a living. This land may be over-cultivated and depleted of its minerals. Poor soils are fragile, vulnerable to erosion and yield less. Over-cultivation accelerates the process of desertification, which destroys complex ecosystems. The protection of natural resources in mined areas becomes almost impossible, and sustainable development plans are forced to be put on hold. For example, there are parts of north-west Egypt which are inaccessible as they still contain land mines from the battle of El Alamein in 1942.

WHO (2003) calculated both the human and environmental effects of a global nuclear war. It estimate that over one billion people would be killed immediately and a further one billion seriously injured: perhaps a total of three billion (half of the world's population) would be immediately affected. It adds that the spread of radiation would affect even larger numbers of people through the destruction of crops and wildlife, the pollution of seas and water supplies: many people far from the site of the nuclear war

would die of starvation. The manufacture and testing of nuclear weapons by possessors like United States, Russia, France, China Israel and Great Britain also damages ecosystems. Large areas of land have been contaminated in the states of Nevada and New Mexico in the USA, and in French Polynesia, South Australia, and parts of Russia and China. There are waste disposal problems from the manufacture of nuclear weapons in both the USA and Russia.

## **CHAPTER THREE**

### **3.0 DESCRIPTION OF THE STUDY AREA AND METHODOLOGY**

#### **3.1 Description of the study area**

Bortown Jonglei state is located about 105 kilometers west of Juba the capital of southern Sudan.

Bortown Jonglei state is bordered by Ajahager desert in the east and at the Far East is Pibior district, river Nile in the west, Baidit town in the north and Gameza county head quarters in the south. It is an area with Savanna grassland with bi-medal annual rainfall. Serious rains are experience between April and May as well as between August and September.

#### **3.2 Methodology**

##### **3.2.1 Research design.**

The research took place in Bor town Jonglei state southern Sudan. It mainly focused on the impacts of human displacement by war on the environment. The main respondents were the returnees and the already existing communities in the area.

##### **3.2.2 Sample selection and size.**

Both the returnees and the already existing people were the targeted group for the study. It involved respondents of different age and sex structure, different educational back ground, socio-economic activities and political background.

The total of 50 respondents were selected, 20 of which were children and 30 adults.

The simple random sampling method was used whereby the returnees and the already existing people had the same chance of being selected.

Purposive sampling was used to obtain a specific form of data required from both the returnees and the already existing population.

### **3.3 Methods of data collection**

#### **3.3.1 Questionnaires**

It involved administering questions to the respondents who answered the questions in written form. The questions were both closed and open ended in nature.

#### **3.3.2 Photography**

Images of features with specific interest were photographed for data analysis so as to give the comparison of what the respondents say and the existing phenomenon.

#### **3.3.3 Observation**

The researcher was involved in systematic watching in order to acquire first hand information that enabled him prove whether the information given by the respondents is correct. This helped the researcher to relate the observed findings to the data generated from the questionnaire.

#### **3.3.4 Interviews**

This method was adopted to give the researcher quick and flexible first hand information from the respondents and probe more on the topic, especially issues that could not be covered in the questionnaire.

#### **3.3.5 Data processing and analysis**

The researcher made sure that all the questionnaires were successfully filled; this was done by checking the questionnaires immediately after receiving them from the respondents. The researcher sorted the questionnaires and eliminated the irrelevant questionnaires. The collected data was reduced by coding it using tables, charts, percentage to graph analyzed data.

### **3.3.6 Problems faced in executing the study**

The researcher faced the following while in the field;

Financial constraints; Lack of money to financial demand of the research assistance limit the ability to cover the whole area of town, so the coverage wasn't easy and this creates inadequate in data collection.

Wrong perception by local people; Local people had wrong perception about why the researcher should interview them. They associate the researcher with spies and those politicians who just take information from them with out return. This made them not to deliver all the relevant information

Long walking distance; Bortown is an infant town which has got no enough feeder roads. This compelled the researcher to trek to various localities so as to obtained information.

Heavy rainfalls; Heavy rains are normally experienced from July through August to September and this when the research was carried out. This could greatly stop the research from carrying out the research within the time frame thus resulting to the extension of research Period.

Flood; The presence of heavy rainfalls made many areas to got undulated with water and this cause so much frustration as passage become a problem a alongside the walking distance on water.

Ignorance; Illiteracy among the respondents limits their understanding why the researcher ask them some questions. This made number of respondent not to give accurate information.

Corruption; Southern Sudan where Bortown as a case study area belongs as states headquarter is one of the Country currently shown for corruption. So most of the top government officials who suppose to give the necessary information could not easily do so because they think their respond to the questions ask may unveil their corrupt nature.

So the researcher could not find the actual operational problems on the ground concerning the institution like Ministry of health, Education, Agriculture to mention a few.

## CHAPTER FOUR

### 4.0 Presentation and interpretation of research findings

#### 4.1 FORMS OF ENVIRONMENTAL DEGRADATION IN BORTOWN

In Bortown, there are several forms of environmental degradation which taking place as resulted of South-North war. Those include deforestation, water shortage, poor sanitation, poverty, poor solid waste management and floods occurrences.

Table 1: Forms of environmental degradation

Forms of environmental degradation	Number of respondents	Percentage (%)
Deforestation	9	18
Poor sanitation	12	24
Poverty	10	20
Poor solid waste management	8	16
Flood occurrences	4	8
Pollution	6	14
Total	49	100

##### 4.1.1 Deforestation

The concentration of high population in town due to fear from cattle raiders, food shortage, and need for jobs made human activities concentrated within the protected

zones of almost 10 kilometers from town periphery. Local people have cleared trees all round town for fire wood and building materials. The clearance of vegetation takes up 18% of the existing forms of environmental degradation.

Such operation endangered the vulnerable vegetations under pressure since people can not make it to collect firewood in far ends.

As the majority of the people in town are repatriates with low income, they resorted to cutting of trees for charcoal that can earn them a living when sold. The heavy dependency on tree cutting for charcoal to earn a living due to limits of other income commercial activities in town and this enhance vegetation disappearance at a faster rate than the natural rate of rejuvenation for example Malualagorbar was a well known forest reserve but is now cut down to no forest at all. It has been encroached for settlement and farming.

#### **4.1.2. Poor sanitation**

This is shown by its highest percentage (24%) among the other forms of environmental degradation. The state of hygiene and sanitation practice is not up to date in town. This is highly ignited by congestion among the residents which couple with lack of latrines and poor waste disposal system all over town. The sanitary activities in town are constrained by the soil nature which easily collapse during rainy season. The town is still under survey yet a majority of the population in town is not staying in the plot legally allocated to them so they don't see the need of putting up latrines. Everyone waits as if he /she will get reallocated the next day so his or her work shall be in vain.

In most areas, one finds that the great stumbling block for not putting up pit latrines even during the dry season is the nature of land ownership despite their level of awareness.

All the space left between homesteads and dark corners are communally made for defecation leave about the school premises and field out of fence.



#### **4.1.3. Poverty**

A majority of the population in town live in abject poverty. This is because the greatest fractions of the population in town are repatriates who had been fully depending on humanitarian food for the last 21 years of war in Sudan. They develop the so called mental physical laziness. No one has a will to move out of the congested town center to the edge so as to acquire enough land for cultivation. People have too moved out of their previous pastoral lifestyle which was their livelihood. The long dependent period deprived them off their ability to reserve or retain their farming skills. Majority of the people are left poor by limiting their capacity to enlarge their income generating activity. Therefore, the 20% of poverty level results from people new lifestyle and presence of the other forms of environmental degradation.

#### **4.1.4. Poor solid waste management**

Solid waste is intellectually considered as any unwanted material that is not liquid or gas. For instance plastic, cans, garbage, papers. Solid waste management in town is greatly poor. The contracting company found it difficult to do its best because of peoples way of dumping solid waste poor management of waste is that people pile up their wastes in big heaps randomly around their homes and polyethylene bags are scattered every where with no order. The town council is not well set so people turn to dump their refuse in public places, path ways and bark yards hence creating bad odour said one of the visitors to town who came across the scenario. So the 16% of the poor waste solid management is a result of poor government policy concerning it.

Plate 1: Waste disposal in Bortown.



#### 4.1.5. Pollution

Pollution in Bortown is found in two forms: water and air pollution. Air pollution is a result of people not intending to avail their wastes to town council for collection in order to avoid charges on collection. They resort to burning of wastes in open ground in uncontrolled manner that is environmentally unfriendly. The production of bad smell create unpleasant atmosphere in town.

Water pollution as a major problem is defined as any physical, biological any chemical change in water quality that affect aquatic animals or makes water less desirable for domestic consumption. The 40% level of pollution. Majority occurs during the rainy seasons. The feaces, heavy metals to mention but a few which accumulate in an open area during dry seasons finds their ways into water bodies like water ponds, wells, rivers, swamps during rainy season. This is majorly experienced in lower southern part of town

where water converges due to the presence of swamps .it becomes much when town gets flooded.

#### 4.1.6. Flood occurrence

The area experiences heavy rains in the month of July through august to September. Greater area of the town is lying in low attitudes. Many areas are swampy; the nature of the road too does not allow free movement of rain water. There are no drainage systems along the road side and not even water drainage pipes that allow water to move across the roads to the low ends .so water remains stagnant and this enhance chances for floods in the area. The soil is naturally clay thus it retains water on the surface. The existence of the above stated situation is what some up to 8<sup>0</sup>% of the occurrence.

**Plate 2:** Stagnant water in Bortown



#### 4.2. Effects of environmental degradation on the environment

The presence of the stated environmental degradation in the town affected many activities as shown in table 2.

**Table 2:** Effects of environmental degradation

Activities affected	Number of respondents	Percentages (%)
Water	13	28
Agriculture	9	20
Education	6	13
Health	10	22
Others	8	17
Total	46	100

##### 4.2.1. Biological diversity loss

Biodiversity refers to the variety and viability of all living things which can be measured at the genetic, species and ecosystem level. The genetic erosion and species loss is greatly indicated by the disappearance of cranes and Ibis which were common dominant type of birds in the area In 1980s before the country ran into the war. The cutting of trees to meet high fuel wood demand for cooking and charcoal burning for domestic use as well as commercial activities to earn a living becomes a major cause of biodiversity loss. Such disappearance of the habitat for animal species enhanced their emigration to where local people can not get access to them.

the poaching of animals for hides, skins and meat is also another cause of biodiversity loss. All the above stated human activities contribute to population reduction in numbers and species of animals which were there before concentration of people in around town.

**2.2. Water Scarcity**

Along side reduction in water quantity, the fewer available sources of water lost quality due to pollution. The existence of poor waste management system in town increases the chance of water pollution during rainy seasons, since run off full of wastes all over town is collected in unprotected wells and swamps around town.

The population in town has suffered from critical water shortage. There are only 25 hand pump boreholes which serve the biggest unknown population in town. This is well shown by long lines of jerry cans waiting for water from morning to evening hours. The shortage of borehole water forces some people to collect bathing water from polluted river Nile water as well as resorting to washing using river water as indicated in plates 3 and 4.

**Plate 3:** Long line of jerry cans waiting to be fetched.

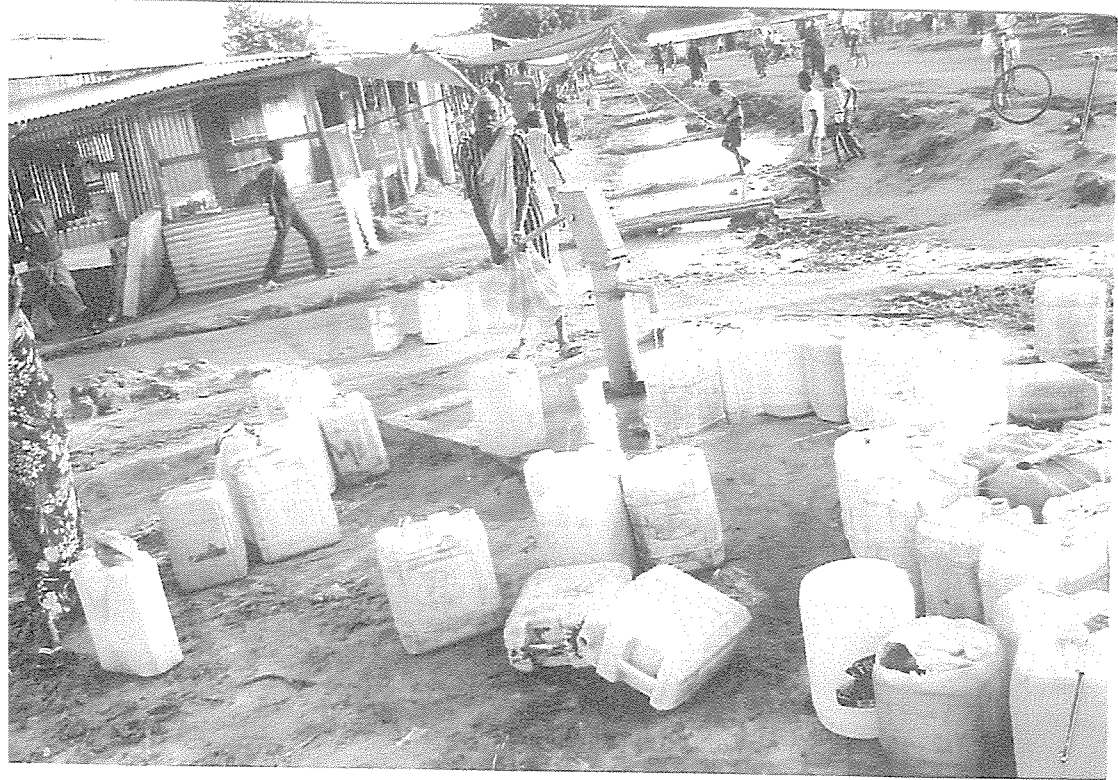


Figure 4: People using river water for washing.



3. Food insecurity

Food insecurity is one of the major effects of environmental degradation in town this is due to several factors as explained below;

Due to the frequent occurrence of famine around town has claimed a lot of lives. The items that subsidized the small ration provided by WFP said several respondents. The lack of enough land coupled with frequent famine to lower agricultural output which is about 20.59% this is because small plots of land around town easily get exhausted and become infertile due to over cultivation and lack of crop rotation practices. People get stuck in town where they can not cultivate.

The WFP is the main food distributing body and it only contributes in three phases to the repatriates, first phase is for 15 days of reception, 3 months of food distribution as they get settled in their homesteads, and finally 3 months of food distribution which mark the final phase.

The food distributed by WFP is very little to satisfy their needs and it is not distributed in time because of rain that spoils roads for convoy access to town. The problem of food insecurity is manifested by malnutrition among the children in town; swollen legs, bulging belly, and soft hair characterized most children indicating lack of diet as a result of food insecurity. One respondent explained that, "the yield of sorghum after harvest will be consumed by household in one or two months because the size of the farm is small."

#### **4.2.4 Poor performance in the education sector**

Education among the school going age in Bortown is majorly affected by environmental degradation.

Poor learning premises coupled with water crisis have made many pupils to lose courage for studies. Children mainly spend long time at water points waiting to fetch water for domestic use which consumes their class time. So for one to get water first, she/she should wake up very early in the morning to line up with jerry cans.

The nature of classrooms is not welcoming, most of the schools have their classrooms built of thatch with unmatted walls. This gives the windy rains an opportunity to interfere with studies during rain seasons.

Scarcity of fuel wood is another factor that has affected education in Bortown. Children are forced in their homes to collect firewood around town which does not give them much time in revising their work as well as attending to home works. This is proved beyond reasonable doubt by the plate below.

Plate 5. Young children on using a borehole



#### 4.2.5. Cholera out break

Poor sanitation in town has contributed to frequent cholera out break. Lack of sanitary facilities has hampered cholera control in town. The poor disposal of human wastes anywhere thought to be good by residents favors the multiplication of vectors that help the easy spread of cholera in town. Cases of cholera out break vary between wet seasons (may-September) and dry season (November-march) for example there 250 people infected and 45 cases of cholera deaths in the month of May 2006. the comparison on cholera out break between wet season and dry season is summarized as shown below in Table 3.



Table 3. Comparison between cholera out breaks in different seasons.

Level of sanitation in different zones	Number of households interviewed	Number of cholera cases per season	
		Wet season	Dry season
A	10	3	1
B	5	8	1
C	6	1	1
D	8	3	2
E	4	2	0

There is strong relationship between the level of sanitation in different seasons and cholera outbreak. The poor sanitation in different seasons account for 60% OF cholera outbreak as shown in table 3

During the wet season, sanitation becomes poor as some places retained water in wet seasons hence favoring cholera outbreak. “said the health personnels.”

An other factor that facilitate cholera outbreak is limited water supply which, that is limited to estimate of 6 litres per person per day.

Lack of enough safe water for domestic purpose forces people to use other un safe sources resulting into water related diseases such as typhoid, dysentery and diarrhea.

Related skin diseases such as ringworm and scabies are also frequent. People have neglected water usage for bathing and washing ,and concentrate on necessities such as drinking and cooking which results into poor person hygiene.

Health workers in town were quoted saying ,”water related diseases account for about 20% of patients and come second only to food insufficient diseases, they also added that 35% of the patients treated were found to suffer from Guinea worms and malaria irrespective of their other complaints, disease resulting from consumption of poor quality water”

Cholera control is very difficult to control due to congestion since, little space that remained does not accommodate pit latrine constructions. This has been made worse by soil being loam. It become difficult to construct pit latrine in flood prone land. therefore making cholera outbreak an interfering factor with the health of residents in town. Malaria cases in the hospital are common due to stagnant runoff in town which create a favorable breeding ground for mosquitoes.

#### **4.3 measures being taken to protect the environment**

The government , individual as well as non-governmental organization have tried to put in place some remedies to protect the environment from their existing form of environmental degradation as explained below

##### **4.3.1 Construction of drainage systems**

The point of concern to solve the problem of stagnant water that create breeding ground for mosquitoes and water pollution in town during rainy seasons was done by constructing one kilometer drainage channel to drain water to the river (Nile). The agent responsible for construction was ADRA. Worst still as these practices results to pollution of Nile water were majority of town population get washing, bathing water as well as for some domestic use but recommendable since its reduces poor sanitation that result to disease causing micro organisms.

late 6: Poster of a drainage system channel



3.2 Construction of public latrines

meet the demand for those homesteads which have not dug their latrines. The ADRA provide drums (5) to those who have dug pit latrines in their houses to reduce the chances collapsing during rainy season. However, this practice has not yet solves the sanitation addition because the program didn't take long to reach every house in the town.

Plate 7: Public latrines



#### 4.3.3 Provision of food items

In solving the food insecurity, WFP provide food items such as maize, grain, oil and beans to the repatriates. Catholic relief services (CRS), Norwegians people aid (NPA) provide high breed seeds to enhance crops yield. They also provide agricultural advisory services through extension offices to farmers so as to equip them with knowledge and skills for proper land use. The handicap international through victim rehabilitation project provides fishing hooks and nets along other things. The organization too provides the vulnerable with mobility devices like crutches, wheelchairs and so forth so as to enable them to perform their activities like others

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#### **4.3.4 Intensification of town survey**

in order to reduce congestion that create the unfavorable condition like poor waste management , pollution, poverty to mention but a few, the governor called for quick survey and allotment of the plot to the people , the construction of feeder roads is also coupling with town survey . The landlords are also required to prioritize the construction of pit latrines once they get their plots.

#### **4.3.5 Installation of motorized water systems**

Peace wind Japan in conjunction with polish humanitarian organization has tried to solve water crisis in town by establishing motorized water system. The system operates throughout as it provides water to the already surveyed areas (homesteads). This reduces water shortages in the already surveyed areas so those living in town center where water is scarce long to join surveyed areas where water is adequate.

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## **5.0 Conclusion and Recommendations**

### **5.1 Conclusion**

Based on the research findings, the following conclusion can be made on the impacts of human displacement by war on the environment. The impacts include; Environmental degradation, effects of environmental degradation, measures being taken to protect the environment from severe environmental degradation.

The major agents of environmental degradation in Bortown is high population that overwhelmed the existing environmental resources in the area. The environmental degradation ranges from deforestation, poor sanitation ,poverty ,poor solid waste management , flood occurrence and pollution

The presence of environmental degradation in the area exhibit so many effects ranging from socio-economic, infrastructural and natural environment as a whole.

The environmental degradation effects ranges from water, agriculture, education, health and others.

With a prevalence of those various problems, many NGO's put in place many measures so as to stop their occurrence.

### **5.2 Recommendations**

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The presence of various forms of environmental degradation and their effects on human lives and the environment is a major challenge in Bor town. In order to succumb such threatening problems to human being, there is an immediate need to control them in order to make the environment friendly as supporting human lives.

Provision of sanitary facilities at both households and community level should be put in place so as to achieve proper management of solid waste. The local government should

productivity. They should be provided with relevant information that can make them to understand the relationship between soil type and crop. Different crops need different soil type. Intercropping and agro forestry should be encouraged so as to make full utilization of soil nutrients in different soil horizon. Rotational practices between cereals and legumes should be emphasized. This is in order to equip people with holistic information concerning sustainable development.

The bigger population in town is semi-illiterate and illiterate thus the lack of enough knowledge concerning the environment. So the involvement of environmental education in informal, formal and non formal institution can greatly solve this problem. The provision of knowledge through environmental education will enable people to adopt wise utilization of natural environment so as to prevent over exploitation and introduction of unwanted materials that may change the environmental quantity and quality to meet human demand. This will enable people to identify that the nature of environment depends on their activities so they should keep doing recommendable activities that does not create negative impact to the environment.

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I am Mr. Yuot Ding John from Kampala International University. I am carrying out research on the impacts of human displacement by war on the environment. It is my pleasure for you to fill this questionnaire with relevant information basing on the questions asked regarding the topic of research.

## SECTION A

### PERSONAL INFORMATION.

1. Age.

10-15	15-25	26-35	36-45	46-55
56-65	66+			

2. Education level.

Primary	secondary	tertiary	university
N/A			

3. Occupation.

Peasant	teacher	doctor	any others like thieves, cattle
keepers investors to mentioned a few.....			

4. How many are you in this family.....  
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5. Where did you live before displacement?  
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6. What were the activities you used to carry out in that area?  
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7. How was the area before war?

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8. How did war affect the following activities?

- Health service  
provision.....  
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- Crop  
production.....  
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- Livestock  
farming.....
- Water  
supply.....  
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- Any other activity that has been  
affected.....  
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9. Is there change that you have seen in the following?

Climate, Soil, Vegetation, Water and sanitation. Yes

No

If yes what has happened to;-

Climate.....  
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Soil.....  
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Vegetation.....  
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Water.....  
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Sanitation.....  
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10. How do people contribute to environmental degradation?

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11. Does the environmental degradation caused by the people affect you?

Yes                      No

If yes, how does it affect you?

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12. Is there a program out in place to reduce environmental degradation in the area?

Yes                      No

If yes what programs are those?

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..... 13. What are the areas that this programs address?

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14. What are the governments efforts to ensuring that environmental degradation is reduced in the area?.....

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15. According to you what measures should be put in place to reduce further degradation of the environment in the area?.....

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## **5.0 Conclusion and Recommendations**

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The presence of various forms of environmental degradation and their effects on human lives and the environment is a major challenge in Bor town. In order to succumb such threatening problems to human being, there is an immediate need to control them in order to make the environment friendly as supporting human lives.

Provision of sanitary facilities at both households and community level should be put in place so as to achieve proper management of solid waste. The local government should

construct landfill for proper disposal in order to avoid the interference of pathogens with the health of people. The NGOs that partnered with the ministry of health on health issues should provide adequate sanitary facilities like skips for proper waste management.

Water purifying agent like trees should be planted around water source to prevent disposition of dust particles into water. To prevent direct entry of run off water that contaminate the well water, protective walls should have to constructed around water points so as to maintain the quantity and quality of water in town.

The establishment of enough water pumps and installation of motorized water pumps system should be encourage in order improving standard provision of adequate water supply to high water demanding population. The governments have to put in place water treatment plant in order to make sufficient use of river Nile water. Sewerage cooperation should too be established so as to avoid water wastage through recycling.

To avoid congestion that contributes to poor waste management system in town, the government through the ministry of physical infrastructure should fasten land allotment process. The government should extend feeder roads to town periphery to encourage people not concentrate in town instead of going to town edge. This should also enhance the provision of health service like waste collection, vaccination, transport among people and so forth.

Not all people who have concern on the existing environmental degradation and therefore the government, political and religious leaders, personnel and donors should provide information to the public on the causes of environmental degradation, their effects on human being and the whole ecosystem through campaign and sensitization using radios, workshops and seminars. People should be made aware to understand the relationship between degradation and its responsive effects. For example poor drainage provide breeding ground for mosquitoes causing malaria and flood, poor sanitation favors cholera outbreak, deforestation cause poor rainfall distribution that result to poor agriculture yield and erosion of top most fertile soil. People should be made aware of the important of practicing crop rotation, intercropping and agro forestry that ensures long lasting soil

productivity. They should be provided with relevant information that can make them to understand the relationship between soil type and crop. Different crops need different soil type. Intercropping and agro forestry should be encouraged so as to make full utilization of soil nutrients in different soil horizon. Rotational practices between cereals and legumes should be emphasized. This is in order to equip people with holistic information concerning sustainable development.

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