



ASSESSMENT OF THE ENVIRONMENTAL IMPACTS OF INTERNALLY DISPLACED
PERSONS (IDPs) IN THE MUNICIPALITY OF BUEA, CAMEROON.

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Abstract

The Anglophone Crisis in Cameroon which has been ongoing for the past 9 years now has caused a lot of people to flee their homes which has resulted to a high number of internally displaced persons in the municipality of Buea. Despite efforts to salvage the situation, most humanitarian efforts have primarily been centered on providing shelter, food, and health services to IDPs with little measures taken in relation to environmental implications of this large influx of people into Buea. This study sought to verify the impact the activities and presence of IDPs have had on the environment of Buea, specifically focusing on waste production and the depletion of natural resources. By using theories related to carrying capacity, stress caused by the environment and sustainable livelihoods, a qualitative approach to collect data from the field was employed. Structured questionnaires were completed by 200 participants (100 IDPs and 100 host households) in addition to observations of happenings in the environment. Results showed that IDPs create additional problems regarding the improper disposal of waste, strong dependency on firewood that increases the pressure on forests, and a scarcity of clean drinking water. And it was concluded that environmental degradation is primarily caused by the lack of adequate infrastructure and socio-economic vulnerability experienced by IDPs when they are displaced, as opposed to the inherent behavior of IDPs.

Language: English

Key Words: Internally Displaced Persons, Environmental Impact, Waste Management, Resource Depletion, Buea Municipality.

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1 Introduction

1.1 Background of the Study

A recent world statistic has it that more people live in urban areas than in rural areas. The United Nations in its 2013 reports revealed that 54% of the world's population are now residing in urban areas (UN, 2014 revised). Urbanization trends in Africa have been characterized by rapid growth and inadequate infrastructure (UN-Habitat, 2011). According to the same report, it is projected that by 2050, 66% of the world's population will be living in urban areas, compared to 30% in the 1950s. Since the 1950s, the urban population of the world has grown rapidly, from 746 million to 3.9 billion in 2014, and is expected to reach 6.3 billion by 2050 (UN-Habitat, 2011). Meanwhile, urbanization in Buea dates back during the German colonial era, as the town was chosen as the capital of the German colony of Kamerun (Ngwa, N. E. 1986). During the colonial period, plantations were developed at the fertile slope of Mt. Cameroon. The colonial administration exported labour from the hinterlands to come and work in these plantations, which increased the population of Buea. However, the population explosion happened in 1993 when the lone AngloSaxon University was created, making Buea the seat of education as far as English Speaking higher education in Cameroon was concerned. Since 1993, the town has witnessed tremendous increase of inhabitants mostly of students who come to pursue their higher education. Apart from students who come every year in their thousands, job seekers, businesses and other commercial activities also contribute greatly to the increased urbanization. The National Institute of Statistics report published in 2007 showed that there has been a steady increase in the population of Buea from 24,584 inhabitants in 1976 to 32,871 in 1987, with a growth rate of 2.7%. Between 1988 and 2005, the population growth rate was 5.6%, with 90,088 inhabitants. In 2020, the population growth rate in Buea stood at 42% compared to 5.6% in 2005, especially in the peri urban areas (NIS, 2016 - ECAM 4).

In recent years, the town has been marked by serious urban immigration caused by the Socio-Political crisis that started in 2016 in the two English Speaking Regions of Cameroon. Despite the unrest in both regions, Buea which is the capital of the southwest region is relatively calm and safer. This is why many have considered it a refuge. Statistics

published by the government of Cameroon in its Humanitarian Plan for the Northwest and South West Regions revealed that an estimate of 74,966 people have been internally displaced; 66,412 in the South West Region and 8,554 in the North West Region. Buea alone registered about 3,000 IDPs according to the Buea Council in 2018 (UNICEF, 2018, OCHA, 2018).

It is but normal that when there is an increase in population of people in an environment, there will be resulting environmental consequences which can be a burden on natural resources, cause stress on environment, increase rampant waste disposals just to mention a few. According to Monoke et al. (2022) and Besinga et al. (2021), the creation of IDP camps in Buea has contributed to a failure to manage waste properly and have increased the consumption of water and forest products which supports the impact focus of resource depletion in this research.

When talking about IDPs, many mistake them for refugees but it is important that a difference be clearly mentioned. Unlike refugees, IDPs are just displaced persons moved by internal conflicts as in the case of the English-speaking parts of Cameroon. Globally, the number of IDPs has significantly increased with approximately 71 million IDPs identified by the Internal Displacement Monitoring Center (IDMC, 2023).

Most often, there is pressure on the environment of host communities as a result of increased in population. The increase in population growth is usually very rapid because when people are fleeing from conflict-affected areas, they have just one thing at the back of their mind; safety. This creates an automatic demand for food, water, housing, energy, and waste disposal infrastructures. The absence of sustainable energy sources has led to the harvesting of wood for cooking and building which contributes to deforestation, as well as unmanaged solid waste results in pollution and adverse health conditions (Braun et al., 2019). Many studies such as resources (Donuma et al., 2024; Hagenlocher et al., 2012; Oucho, J. O. (2009) have indicated that IDP settlements create significant deterioration in lands, biodiversity losses, and depletion of natural resources.

In sub-Saharan Africa for example, displacement is often common due to conflicts, unstable political atmospheres, and natural disasters. A good example is the IDP settlements in Maiduguri, Nigeria, which is associated with poor waste management, water shortages, and environmental contamination (Donuma et al., 2024) and

deforestation at the Pabbo camp in Uganda because IDPs relied heavily on firewood (Samuel, M. 2006).

In our own context in English speaking Cameroon, the ongoing Anglophone Crisis has displaced over 700,000 persons, with Buea being one of the largest host municipalities (OCHA, 2021). While humanitarian responses have centered on food, shelter, and health services, environmental impacts remain relatively understudied. Reports by (Federico et al., 2024) indicate increased dumping of waste in open areas, increasing demand for firewood, and damage of drainage systems.

After taking into consideration other perspectives of the studies of the impact of IDPs, it is very necessary to digress to the perspective of environmental impacts by focusing on waste generation and resource depletion. I believe this perspective will provide information to help guide environmental planning, humanitarian intervention and sustainable development policies in Buea Cameroon.

1.2 Problem Statement

Usually whenever a city or country witnesses increase in population either by factors such as migration or increase in birth rate, it will experience an impact on the environment and its resources. The environmental impact can however be alarming when there is a sudden host of people who have fled from conflict areas for safety because there is no adequate time to prepare for their arrival. So, in my case study of Buea as host community of refuge, there has been noticeable negative environmental impacts some of which includes rampant improper waste disposal, deforestation, and shortage of water supply. These impacts do not just affect the ecological balance negatively but also put the health of both IDPs and Host communities at high risk.

In support of this view, writers like Nkuh et al., (2023) mentioned how improper disposal of waste at dumpsites in Buea has led to environmental and health issues due to lack of proper waste management. Based on my own observations solid waste management in Buea is not well managed. Waste is dumped indiscriminately along roadsides, sometimes openly burned and drainage channels are stuffed with waste washed off by rain thus causing flooding throughout the rainy season. In addition, I could also observe the

indiscriminate felling of trees to be used as source of energy for cooking and wood for building temporal homes.

Although previous studies have made mention of the humanitarian and socio-economic challenges experienced by IDPs in Cameroon at large, there is still very little empirical research made regarding the negative environmental impacts and socio-ecological systems of IDPs. This is what has informed this research work and will eventually provide the necessary insights to policy makers to make improvements for a more sustainable environment.

1.3 Objective of the Study

The purpose of this study is to find out the environmental impacts of internally displaced persons in the municipality of Buea, primarily focusing on the generation of waste and the depletion of natural resources.

1.4 Specific Objectives

- Identifying specific environmental impacts that IDPs are responsible for.
- Evaluate on a considerable level the extent of natural resource depletion attributable to inflow of IDPs in Buea
- Find mitigation measures to reduce the negative environmental impacts meted in the city of Buea.

1.5 Research Questions

- What are the most common environmental impacts that can be traced to IDPs?
- How much of natural resource depletion is likely linked to the influx of IDPs?
- What are some of the current sustainability practices in the city and what more could be done?

1.6 Significance of the Study

This study is quite important as it digresses from the most common perspective of the impacts of IDPs on health, human rights, shelter, food and financial loss. It is a good time to focus on the environment and its current state in relation to rapid increase in population from crises struck areas. It will however provide some insights to stake holders on how much the environment has suffered due to stress from increased population, while also support the sustainable waste management strategies mentioned by Nanje, M. (2021) in his research work on municipal waste systems in Buea.

1.7 Scope of the Study

- **Geographical scope:** The study focuses on Buea Municipality, South-West Region of Cameroon, where many IDPs are currently hosted.
- **Content scope:** The research assesses waste generation and natural resource depletion linked to IDPs, without going into detailed health or socio-economic impacts.
- **Time scope:** The study reflects the situation as observed in recent years during the Anglophone crisis displacement (2016 – Present)

2 LITERATURE REVIEW

In recent times, writers have been on the subject matter of IDPs in Cameroon especially as the ongoing anglophone crises emerged nine years ago, environmental drivers of migration, such as resource scarcity and climate variability, also shape displacement patterns in Sub-Saharan Africa (Wolde et al., 2022). Other researchers have addressed several perspectives of the impact of IDP such as healthcare (Omam et al., 2021), security concerns (Mafany & Budi, 2019), sustainance (Osagioduwa & Oluwakorede, 2016), access to education (Safotso, 2020), and disaster management (Bang & Balgah, 2022).

However, I have observed that in Sub-Saharan Africa, displacement is largely conflict-driven, and its environmental impacts are evident and documented to an extent. In Nigeria for example, studies in Maiduguri revealed that IDP camps produced large amounts of plastic and organic waste, often dumped in open spaces, contributing to land pollution and increased vector-borne diseases (Donuma, Kyari Umar, et al 2024) but there wasn't any emphasis made on resource depletion which is an underlying issue this study seeks to address. During the up raising of the insurgency of Boko Haram, the city accommodates more migrants from the affected local government areas of the State in the IDP camps contributing to its population growth and demographic diversity. Indiscriminate disposal of plastic bottles and sachet water bags is common, with waste often being dumped in open spaces, drainage channels, water bodies, and along roadsides. The accumulation of plastic waste not only detracts from the aesthetic appeal of the environment but also poses risks to human health and ecosystem integrity.

On the other side of East Africa, Pabbo camp in northern Uganda recorded severe deforestation as IDPs depended on firewood for cooking. Fire outbreaks were also common due to overcrowding and poor waste disposal (Roberts, Bayard, et al 2009). This study however focused on resource depletion and ignored the waste generation, and threats caused by the waste in the environment.

In a research done by Acha-Anyi, et al (2024), I realised that he provided a comprehensive analysis of human right needs of IDPs in Cameroon, with a special focus on the Northwest, Southwest, and Littoral regions. This analysis is particularly important with regards to the current displacement crisis plaguing Buea, as it touches issues which cuts across different

challenges faced by the displaced populations such as lack of access to shelter, food, healthcare, and education. The scope of this perspective provides valuable understanding of the psychosocial and structural challenges of internal displacements. However, while the study brings an important contribution to the subject matter, it has several limitations which needs to be addressed. Though the subject of human right is fundamental to consider, the health of the environment where they are a part of should be considered with more intentionality. Issues like the role of social work remains conceptual and does not actually provide a clear view of how social workers are implicated in creating environmental awareness to the IDP population. So much was discussed about human rights and social services which is quite formidable, but nothing was highlighted in relation to environmental impact which I think it's a major concern as IDPs need to be in a friendly environment which is not void of sustainable practices.

Taking a look at another research work made by Wantim et al. (2023) concerning the city of Limbe which is just a neighbouring town to Buea, he observed that the town faces recurrent flooding due to poor waste management which has led blockage of city drainage channels. It was mentioned also that over 85% of waste bins were found to be in poor condition, as a result of improper waste disposal habits. The study successfully established a link between poor waste disposal habits and environmental health challenges, including flooding not as a result of natural causes but poor waste management practices which has led to blockages resulting to high risk. The perspective of this author is commendable, but it does not measure the impact of the presence of IDPs in that part of the country. These are part of the shortcomings that inspires further research into the subject matter.

2.1 THEORITICAL FRAMEWORK

The scope of theories used in my research is centred around; Carrying Capacity Theory, Environmental Stress theory and Sustainable Livelihood Framework. They give a clear understanding of the environmental consequences of internal displacement in relation to waste generation and resource depletion.

2.1.1 Carrying Capacity Theory

Carrying capacity is the maximum population that a given area can sustain. The measures commonly used include the number of individuals or the total biomass of a population, which are each highly dependent on differences in physiology and age structure among species and across large taxonomic groups (Levin, S. A. 2013). Every environment has the required ability to support a particular number of human population and its activities without undergoing degradation. When the population exceeds this threshold, the environment begins to deteriorate due to overuse of resources and accumulation of waste. In view of our case study Buea, the massive inflow of IDPs from neighbouring crises plagued zones, has meted serious impact on the environment. There has been pressure on land, water, and waste management systems. According to (DuPuy, Galaitsi, & Linkov, 2025), this theory helps explain how displacement can lead to unsustainable environmental practices and strain on local infrastructures.

2.1.2 Environmental Stress Theory

Environmental Stress Theory seeks to explain how environmental degradation and resource scarcity contribute to psychological, social, and health-related stress. It is a common issue which is relevant to situations of displacement, where overcrowding, poor sanitation, and improper waste disposal poses very high environmental risks. In Buea for example, indiscriminate dumping of waste which is the main cause of blocked drainage systems has intensified flood risks and waterborne diseases. This theory supports the argument that environmental stressors not only affect ecological balance but also undermine the health and resilience of displaced populations and host communities (Cohen, Evans, Stokols, & Krantz, 1986).

2.1.3 Sustainable Livelihoods Framework (SLF)

The Sustainable Livelihoods Framework which originates from the UK Department for International Development (DFID) in the late 1990s, provided a compelling counterpoint to purely economic or sector-specific approaches to poverty. For IDPs in Buea, displacement have completely disrupted their daily lives and created an imbalance such that even access to basic necessities is a major challenge. This has pushed them to adopt

coping strategies which are not environmentally friendly leading to further degradation of the environment. The SLF provides an assessment of how environmental impacts intersect with social and economic vulnerabilities, guiding the development of more sustainable and inclusive interventions (Natarajan, Newsham, Rigg, & Suhardiman, 2022).

These theories put together provide a firm foundation for a deep search into the environmental impacts caused by IDP population increase. They give a good picture of the interconnection between mass population pressure, environmental degradation and livelihood sustainability. By putting these perspectives together, the aim of this study is to give a perfect understanding of how displacement affects both ecological systems and human well-being, and to inform more effective policy and planning responses for host communities and displaced populations as well.

3 METHODS AND PROCEDURES

3.1 Research Design

In this study I used a qualitative research design. This design was chosen because the aim of the research was to understand community perspectives, practices and experiences going on as touching aspects of environmental sustainability. I am not trying to quantify the level of waste generation or resources depleted which is connected to IDP practices. This approach permitted me to collect descriptive data that gives a clear view of the actual conditions or realities of displaced individuals are facing currently in Buea.

3.2 Area of Study

This study was carried out in the Buea Municipality, located in the South-West Region of Cameroon Figure 1 Buea is the headquarter of the Southwest region and historic German Kamerun headquarters situated on the eastern slopes of Mount Cameroon, with an estimated population of over 140,533 inhabitants according to Worldometer, (2025) including a large number of IDPs that the city is hosting due to the current Anglophone crisis. The area covers both urban and rural communities, where displaced populations have settled with relatives, but mostly in temporary rented accommodations.

Buea has an equatorial climatic condition with heavy rainfall that contributes to flooding during the rainy season. The forests surrounding Buea are a source of firewood for many households, while streams and wells serve as key water sources especially in the Mile 16 Bolifamba neighbourhood where I once lived. All these are factors that make the area to be vulnerable to environmental stress.

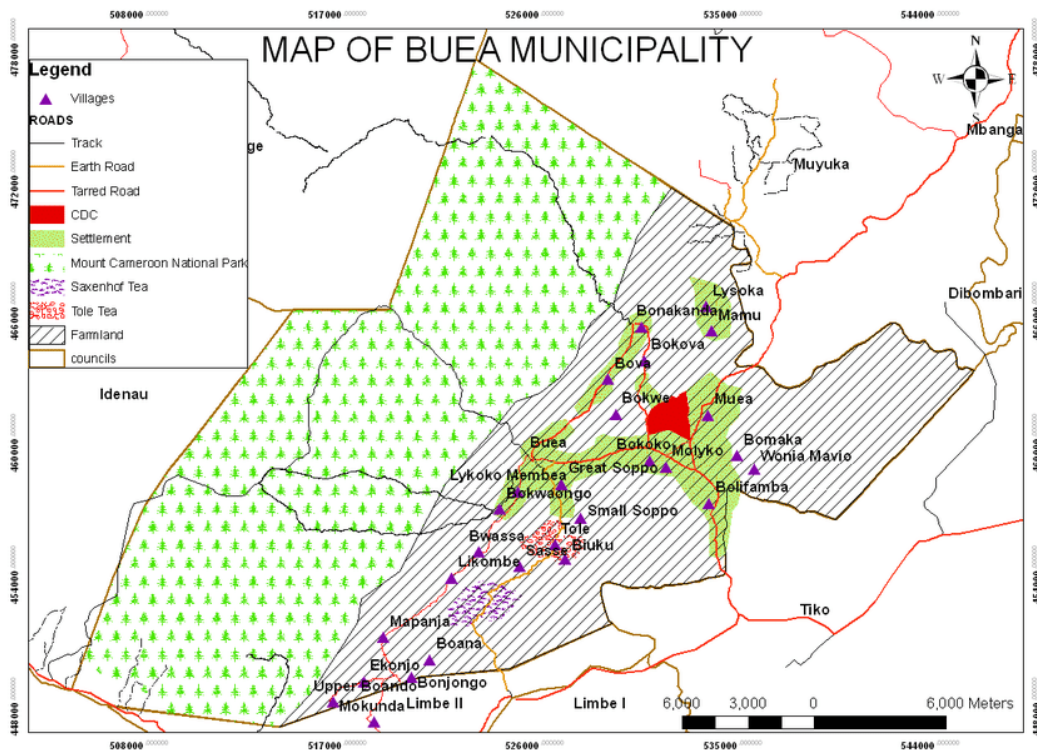


Figure 1: Map of Buea Southwest Region
Source: Levai, Lewis Doggima, et al (2025).

3.3 Target Population

The target population relating to this study comprised of IDP households and host community households living within Buea Municipality. IDPs included those displaced by the Anglophone crisis who had settled in the town between 2016 and 2024. The host community respondents included residents of Buea who had not been displaced but lived in areas with IDP settlements.

3.4 Sample Size and Sampling Technique

The sample size included a total of 200 respondents:

- 100 IDP households.
- 100 Host community households.

A purposive sampling technique was used to ensure that the selected respondents were knowledgeable about the issues under study. Priority was given to households in neighborhoods with visible IDP presence and where environmental challenges were prominent. (Locations such as Muea, Mile 16, Great Soppo, Bokwango)

3.5 Data Collection & Analysis Tools

The primary data collection tool was a structured questionnaire designed with Yes/No questions. (See appendix 1) The choice of format was to keep questions and answers as simple as possible considering the fact that there may be some IDPs who have low literacy levels. The questions were subdivided into sections of waste generation & disposal practices, resource use (fuelwood and water), and perceptions of environmental change.

In addition to observations made, some photos were taken to illustrate the actual reality on ground. They include dumps on street, pathways, streams, bridges and residential areas. Data collected from the field by way of questionnaires (between late October and Early November 2025) were analysed using Microsoft excel tools. The tables, figures, graphs and illustrations were done with Excel.

4 RESULTS AND INTERPRETATION

In this chapter, I will be presenting the findings I got from the field. Data was collected through structured Yes/No questionnaires administered to 200 respondents (100 IDPs and 100 host community members) alongside field observations and pictures. The Data was then analyzed using descriptive statistics and thematic analysis, with results presented as comparative percentages to show differences between IDPs and host households in waste management, natural resource depletion, and environmental perception.

4.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Table 1: Social Demographics

Socio Demographic Characteristics				
Heads of Home				
	IDPs	%	Hosts	%
Male	60	60%	72	72%
Female	40	40%	28	28%
Total	100		100	

As seen from **Table 1**, altogether 200 respondents participated in the survey with even distribution between both categories (N=100). Households headed by displaced females were considerably higher (40%) than households headed by female hosts (28%) which reflects gender impact of displacements. This has a great impact in their lives as they will be forced to adopt unsustainable coping strategies to cater for their families. The end point will be stress meted on the environmental resources.

4.2 WASTE GENERATION AND DISPOSAL

Table 2: Waste Disposal Practices

Waste Generation and Disposals				
	IDPs	%	Hosts	%
Open Waste Disposal	85	85%	55	55%
Waste Burning	10	10%	7	7%
Access to Bins	5	5%	38	38%
Total	100		100	

The Table 2 above shows a simple comparison of waste generation and disposals between IDPs and Hosts communities based on 3 factors: Open waste disposal, Waste burning and access to bins. 85% of IDPs practice open waste disposal opposed to 55% of Hosts. This shows that open waste disposal is a common practice between both parties. But the difference is that IDPs do more because they are new in the environment and have adopted the practice more seriously than the hosts. The same can be said for waste burning between both parties. While for access to bins, the Hosts communities show a significantly greater figure of 38% compared to IDPs 5%. Usually, the first instinct of IDPs is not proper waste disposal practices but survival. So despite their current financial constraints, they will prefer to feed or shelter than spending on acquiring waste bins.

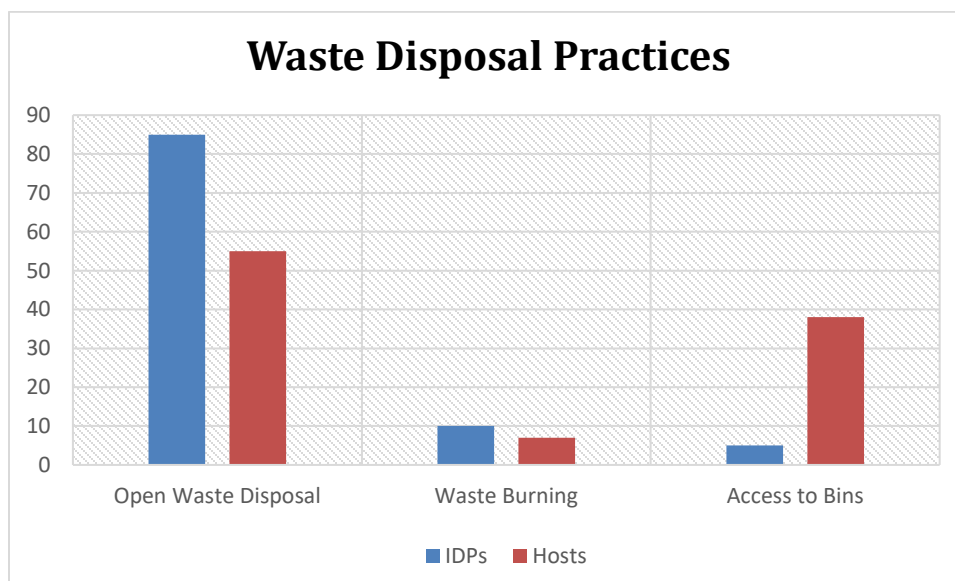


Figure 2: Graphical illustration comparing waste disposal practices



Figure 3: Indiscriminate Dumping of Waste

Source: Field Work, 2025



Figure 4: Open Dumping by the Stream

Source: Fieldwork 2025

Key observations:

According to my own observations from the field, dumpsites are located in environmentally sensitive areas including proximity to passing streams, foot paths and residential areas. Photographic evidence from Molyko and Mile 16 documented waste overflow blocking drainage channels and creating stagnant water pools which creates a breeding ground for mosquitoes. (see **Figure 3, Figure 4**)

Based on these findings and comparisons made in **Figure 2**, I can reliably conclude that, IDPs contribute disproportionately to poor waste disposal outcomes, primarily due to

limited access to municipal waste management services and inadequate waste disposal infrastructures for IDPs. And the lack of environmental health practices may further compound these challenges.

4.3 NATURAL RESOURCE DEPLETION

4.3.1 Fuelwood Use

Table 3: Primary cooking Fuel

Primary Cooking Fuel	IDPs (%)	Hosts (%)	Difference
Fuelwood	92	38	+54
Gas/Kerosene	8	62	-54

From the tabular comparison above **Table 3** the dependence on firewood as a primary cooking fuel source between both entities shows a wide gap. An overwhelming 92% of IDP households reported using firewood as their main source of cooking fuel, compared to only 38% of host households. It can also be seen that host households use predominantly cleaner and a bit more sustainable energy alternatives like gas and kerosene (62%) compared to the few (8%).

My field observations also revealed evidence of resource depletion in the form of cleared patches of wood along the forest edges of Bokwango and Great Soppo. Areas where IDPs collect firewood on daily a daily basis. This is a major concern because it only helps to promote deforestation, soil degradation, and generally the loss of biodiversity in the municipality.

4.4.1 Water Resources

Table 4: Distribution of Water Resources

Water Source	IDPs (%)	Hosts (%)	Difference
Communal Wells/Springs	78	48	+30
Pipe borne Water	22	52	-30

Based on the comparison made in **Table 4**, water access structures further illustrate the gap between IDPs and Hosts communities. Majority of IDPs (78%) rely on communal wells and springs for their water needs, with respondents reporting waiting and queueing for several hours at public taps. In contrast, a significant number of households (52%) have access to piped water systems as opposed to 22% of reported population of IDP having access to piped water indicating a 30% difference in this regard.

Observed Impact:

Majority of my respondents from both IDP and host communities noted that water scarcity had intensified since the arrival of displaced populations in the municipality. This increased pressure on water resources is consistent with findings from similar displacement contexts such as the Minawao refugee camp in Cameroon where IDPs were documented to have experienced strain natural water sources. (Kodji et al., 2021).

4.4 PERCEPTIONS AND ENVIRONMENTAL CHANGE

Table 5: Combined Environmental concerned by both Host and IDPs

Flooding Due to blocked drainage	70%
Bad odors and insanitary conditions	65%
Deforestation and firewood scarcity	65%
Increased Disease prevalence	45%

From the thematic analysis of questionnaire responses and short conversations that I got from my respondents revealed widespread awareness of environmental degradation amongst IDPs and Host communities as could be seen in **Table 5**. The most frequently cited environmental concern was flooding during the rainy season mostly caused by blocked drainage systems. 70% of all respondents mentioned this particular concern. This however convincingly ties with my field observations of waste accumulation in drainage channels, bridges and gutters in areas densely IDP populated areas.

Bad odor and insanitary conditions near open dumpsites were reported by 65% of respondents, reflecting the proximity of waste disposal sites to residential areas and the lack of proper waste management infrastructure. Another 65% of respondents shared that they depend solely on forest wood as their source of energy for cooking. Meanwhile, 45% of respondents expressed deep concerns about waterborne diseases which are most common health threats. Malaria and Typhoid fever are the most common deadly illnesses and IDPs are most likely to be vulnerable to them because of their living conditions and lack of sufficient health care facilities.

4.5 COMPREHENSIVE COMPARISON OF ENVIRONMENTAL INDICATORS

Table 6: Comparison of Environmental Indicators

Environmental Indicators	IDPs (%)	Hosts (%)	Difference	Impact Level
Open Waste Dumping	85	55	+30	HIGH
Waste Burning	65	30	+35	HIGH
Access to Waste Collection	20	48	-28	LOW
Firewood Dependency	92	38	+54	CRITICAL
Gas/Kerosene	8	62	-54	CRITICAL
Communal Water dependency	78	48	+30	HIGH
Piped Water Access	22	52	-30	LOW

Remarks about Results and Interpretation:

It is very important to note that, despite the findings presented in **Table 6** which shows the gross impact of IDPs on the environmental scope of the Buea municipality, it does not mean that they are solely responsible for environmental degradation. Rather, the findings provide us with the environmental consequences of displacement when adequate infrastructure, services and resources are not provided to accommodate increased population density. The impacts measured from my findings is largely driven by limited access to basic infrastructures such as decent disposal bins, waste management services, and sustainable energy.

5 CRITICAL EXAMINATION AND DISCUSSIONS

In this chapter I will be explaining how the findings I got from the field relates with my objectives, existing literature mentioned, and how it fits into the theoretical frameworks used in this research. I will also be discussing the causes of observed environmental impacts, comparing findings similar to displacement contexts while reflecting on the state of environmental management and humanitarian response in the Buea municipality.

5.1 Environmental Impacts of IDPs: A challenge of major concern

My findings reveal that IDPs in Buea contribute to environmental degradation through poor waste disposal practices and improper use of natural resources which has resulted to resource depletion. However, it is worth noting that, these impacts are not solely characterised by displaced populations but rather implications of systemic failures in planning, infrastructure, and humanitarian response to crises. IDPs to some extents are only negative contributors and amplifiers to these unhealthy practices.

There is a considerable difference 30% higher rate of open waste dumping among IDPs compared to host communities. It is an indication that IDPs do not properly integrate with the waste management systems in place. These findings support observations from Maiduguri, Nigeria, where (Donuma, Kyari Umar, et al. 2024) documented similar patterns of indiscriminate waste disposal in IDP camps due to insufficient waste collection infrastructure.

Also, when we look at the impact of firewood dependency which is critical (54%) shows how much of dependency IDPs rely on forest woods as primary source of energy. This relates to a similar finding made by Samuel, M. (2006) of severe deforestation around Pabbo camp in Uganda, where displaced populations had no alternative energy sources. The environmental consequences extend beyond immediate resource depletion to include soil erosion, biodiversity loss, and disruption of ecosystem services that sustain both displaced and host communities.

5.2 Carrying Capacity and Population Pressure

From the findings presented in the results, when we consider the carrying capacity theory in this context, we observe that the town has been pushed beyond its sustainable threshold. Increase in population is already a sign, shortage of portable water supply, insufficient houses, increase in deforestation amongst many others. High population density has put so much pressure on housing capacity making accommodation relatively expensive due to shortage. The theory holds that when population exceeds carrying capacity, environmental degradation accelerates as could be seen from the blocked drainage systems, shortage of water resources, and depleted forest resources.

The 70% of respondents who reported flooding due to blocked drainage is a clear example of how exceeding carrying capacity creates serious environmental hazards. Wantim et al. (2023) mentioned similar flooding patterns in Limbe, attributing them to poor waste management and inadequate drainage infrastructure. Another issue that further illustrates carrying capacity constraints is water resource pressure. 78% of IDPs rely on communal wells and springs, compared to 52% of hosts with piped borne water access which demonstrates unequal distribution of water supply infrastructure alongside increase in overall demand. These findings can also be likened to observations made from Minawao refugee camp documented by Kodji & Ibrahima (2021) where displaced populations strained natural water sources, leading to conflicts over access and deteriorating water quality.

5.3 Environmental Stress and Community Well-being

The Environmental Stress Theory provides valuable insights into how environmental degradation affects both displaced and host populations. As reported, there is an increase in waterborne diseases which reflects direct health consequences of environmental stress caused by factors like inadequate sanitation, indiscriminate waste disposal. IDPs are the most vulnerable in situations like this because of overcrowded living conditions, limited access to health facilities, settlements in unsafe areas.

The 65% of respondents that reported bad odours and insanitary conditions near open dumpsites indicates widespread exposure to environmental health risks. From field observations of waste accumulation in environmentally sensitive areas, including proximity to streams and residential areas is clear proof of the deplorable conditions in which residents find themselves not leaving IDPs out of the problem.

5.4 Livelihood Strategies and Environmental Sustainability

The Sustainable Livelihoods Framework explains how displacement disrupts access to livelihood assets and survival, forcing IDPs to adopt coping strategies with negative environmental consequences. An overwhelming percentage of IDPs (92%) who rely on firewood as an energy source is clear proof that there are no alternatives to a cleaner fuel/energy source, which could be because of lack of sufficient financial resources to afford. These findings challenge the narratives that blame IDPs for environmental degradation but highlight how poverty and displacement constraints sustainable choices.

The framework clearly emphasizes that sustainable livelihoods require balanced access to natural, human, financial, social, and physical capital. From my findings, IDPs in Buea demonstrate significant limitations across these dimensions: limited financial resources (constraining access to gas and formal waste services), reduced social capital (limiting integration into host community), and minimal access to physical infrastructures (piped water, waste collection systems). These asset deficits force reliance on natural resources such as forests for firewood, communal water sources which eventually leads to environmental degradation.

According to Natarajan, Newsham, Rigg, and Suhardiman (2022) they argue that effective interventions must address underlying livelihood vulnerabilities rather than merely restricting resource use. In Buea's context, this will mean providing alternative source of energy, expanding waste management infrastructure to IDP settlements, and creating income-generating opportunities that reduce dependence on natural resource extraction. Without such integrated approaches, environmental conservation will be a farfetched sort after theory.

5.5 Comparative Analysis with Regional Displacement Contexts

When I look at the situation of Buea compared to other displacement contexts in Sub-Saharan Africa, it reveals similar patterns and contexts. Like Maiduguri's IDP settlements (Donuma, Kyari Umar, et al 2024), Buea experiences severe waste management challenges driven by inadequate infrastructure and humanitarian focus on immediate survival needs rather than environmental sustainability. However, the city's integration of IDPs into host communities rather than concentrated camps creates diffused environmental impacts across wider areas, making coordination and intervention a daunting task.

Also, deforestation patterns around Buea is similar to Uganda's Pabbo camp experience (Samuel, M. 2006), but with different ecological contexts. Buea's equatorial climate and Mount Cameroon forest ecosystem faces a completely different biodiversity conservation challenges compared to Uganda's savanna woodlands. The loss of tropical forest resources around Buea carries implications for endemic species, watershed protection, and climate regulation that extend beyond local resource availability.

Lastly, regional studies across Cameroon including Bang, H. N. (2024) documentation of resource conflicts and Citaristi, I. (2022) reports on inter-community tensions, suggest that environmental degradation caused by displacement can trigger broader social instability. Buea has thus far avoided major resource-based conflicts, but the 82% of IDPs reporting firewood scarcity and ongoing water stress indicate potential for future tensions if resource pressure continues unaddressed.

5.6 Limitations of Studies

- I was not able to measure the environmental state of the municipality before the crises. One reason is because there is no sufficient research materials made with regards to the environmental impact of IDPs in Buea as touching the aspects of waste generation and resource depletion.
- IDPs reluctance to participate in survey due to stigma and security concerns which would have a different environmental practice or perceptions than those included in the sample.
- The survey questions had limited demographic factors like age, gender which would have been useful to check which age group are displaced and how they carry out sustainable practices.
- Security concerns arise from pre and post electoral processes. It was difficult to properly engage people during that period.
- There was no possibility of GIS mapping of deforested areas. This can be considered when carrying out future research.
- Transportation challenges and accessibility issues made it difficult to reach IDPs living in remote parts of Buea.

5.7 Recommendations

For Municipal Authorities (Buea Council)

- Expand waste collection services in neighborhoods hosting IDPs by providing bins, regular collection, and safe dumpsites and sensitize inhabitants about proper waste disposal practices. It will reduce indiscriminate waste disposals and littering.
- Invest in drainage improvement projects to reduce flooding caused by waste blockage. There is the need for proper town planning and reconstruction of drainage channels to ease the flow of water when rain falls.

For Humanitarian Organizations and NGOs

- Provide alternative cooking fuels and energy-saving stoves to reduce pressure on forests. This is because many displaced persons do not have the necessary means to afford such.
- Support community awareness campaigns on waste separation, composting, and sanitation practices.
- Involve IDPs in environmental clean-up campaigns to improve community relations and responsibility as a way of connecting to the environment on a healthy grown.

For Policy Makers

- Integrate environmental sustainability into IDP response plans at both local and national levels.
- Enforce stricter waste disposal regulations in urban areas, with penalties for indiscriminate dumping.
- Preplan adequate response for crises as such.

Other Recommendations

Going through the GUIDANCE ON SOLUTIONS TO INTERNAL DISPLACEMENT, a document prepared by the office of the Special Adviser on Solutions to Internal Displacement with Members of the UN Sustainable Development Group (UNSDG) and the Inter-Agency Standing Committee (IASC) February 2025. They made quite important recommendations at a global level which I think can be added to the already listed recommendations given in Cameroon's context.

1. Adopt a Rights-Based, Development-Oriented Approach

This will include doing the following.

- Ensure solutions uphold human rights, safety, dignity, and non-discrimination for IDPs and host communities.
- Avoid coercion; decisions on return, resettlement, or local integration must be voluntary and informed.

Integrate IDPs into national development plans, social protection systems, and urban planning to prevent informal settlements and environmental degradation.

2. Lay the Groundwork Early

This will include doing the following.

- Plan responses from the onset of displacement with a medium- to long-term perspective to prevent protracted crises.
- Combine humanitarian assistance with early development action, prioritizing: Area-based approaches that include host communities, Investments in housing, land, and property rights, livelihoods, and social services.
- Promote climate-resilient development and risk-informed planning to reduce vulnerability to disasters and secondary displacement.

3. Gather Evidence and Monitor Environmental Impact

- Invest in national data systems to track IDP locations, resource use, and environmental pressures.
- Use urban profiling, climate risk modeling, and disaster loss data to inform planning.
- Apply the IASC Durable Solutions criteria to measure progress, including access to safe housing, water, and sustainable livelihoods.

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APPENDICES

QUESTIONNAIRE

Project Title: Assessment of the Environmental Impacts of Internally Displaced Persons (IDPs) in Buea Municipality, Cameroon.

Introduction to Respondents:

Dear respondent,

This questionnaire is designed solely for academic purposes, as part of a research project on the environmental impacts of internally displaced persons (IDPs) in Buea Municipality. Your responses will remain strictly confidential and will be used only for research purposes. Kindly answer honestly by ticking Yes or No where applicable. Thank you for your cooperation.

Section A: General Information

1. Are you an Internally Displaced Person (IDP)? Yes No
2. Are you a member of the host community? Yes No
3. Is your household headed by a female? Yes No
4. Do you have more than five members in your household? Yes No

Section B: Waste Generation and Disposal

5. Do you dispose of your household waste in open dumps? Yes No
6. Do you burn waste in your compound or nearby? Yes No
7. Do you separate organic waste (food remains) from plastics and metals? Yes No
8. Do you have access to a waste bin or municipal waste collection service? Yes No
9. Do you think the volume of waste has increased since IDPs arrived in this area? Yes No
10. Are drainage channels in your community often blocked by waste? Yes No

Section C: Resource Use and Depletion

11. Do you use firewood as your main source of cooking fuel? Yes No
12. Has the demand for firewood increased since IDPs settled in this community? Yes
 No
13. Do you rely on communal wells, springs, or streams for water? Yes No
14. Has access to water become more difficult since IDPs arrived? Yes No

Section D: Perceptions of Environmental Change

15. Have you noticed increased flooding due to blocked drains in your area? Yes
No
16. Do you think air quality has worsened due to open waste burning? Yes No
17. Have you observed deforestation or tree cutting in nearby forests? Yes No
18. Do you believe disease cases (malaria, typhoid, diarrhea) have increased due to poor sanitation? Yes No
19. Do you think IDPs should be involved in environmental clean-up campaigns? Yes
 No
20. Do you believe the local council is doing enough to manage waste in your community?
 Yes No

Section E: Recommendations

21. Do you support the introduction of stricter penalties for improper waste disposal?
Yes No
22. Do you think the provision of alternative fuels (e.g., gas, improved cook stoves) would reduce deforestation? Yes No
23. Would you be willing to participate in community waste management activities?
Yes No

Thank you for your time and cooperation.

