



Research Article

Climate Security Risks and Its Impact on Women and Children in the Lake Chad Basin

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Abstract

This paper examines the impacts of climate insecurity on women and children in the Lake Chad Basin as well as the regulatory policies and strategies that could help these vulnerable groups to resist and survive climate security risks. While the region contributes but little to greenhouse gas emissions and global warming, Lake Chad Basin has become more exposed to the impacts of environmental changes including climate security risks like erratic rainfall, high temperature, drought, flood, food insecurity, water scarcity, displacement, regional economic and political instabilities. By employing the frameworks of environmental security theory and feminist political ecology theory, this article strives to justify how environmental changes affect community's security and stability especially on women and children. This research draws on secondary sources to expatiate on the adverse impacts of climate insecurity on women and children such as health care, education, social roles and gender dynamics, revenue and livelihood, and psychology effects. In the same vein, case studies and evidences substantiate these impacts alongside a comparative analysis. This study further recommends both interventional and adaptive strategies to address climate security and improve the support for women and children in the Lake Chad Basin, while reinstating the roles of the local and international organizations in protecting women and children from climate induced risks.

Keywords

Lake Chad Basin, Climate Security Risks, Gender, Children, Vulnerability, Displacement, Women

1. Introduction

The effects of environmental degradation incline communities to different negative impacts including climate security risks such as erratic rainfall, high temperature, flooding and droughts, food insecurity, lack of clean water, displacement and instabilities. The Lake Chad Basin exemplifies this situation, as it is affected by numerous environmental insecurities, as well as economic and political instabilities. Such climate security risks continually expose communities to danger, with

women and children being the most vulnerable [50].

While previous researches have solidified the foundation of the impacts of climate insecurity in the Lake Chad Basin and gender vulnerabilities [11, 12]. This paper reinforces the impacts of climate insecurity on women and children, as well as looking at the responses of local and international organizations to implement the measures that could act as climate "threat minimizers" as well as support women and children.

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Climate change is often attributed to greenhouse gas emissions and global warming that are majorly caused by human activities like coal, oil and gas, as well as ecosystem biodiversity. The Lake Chad Basin represents one of the regions most severely impacted by climate change in the world [48, 67]. Since the intense drought in the 1970, the Lake Chad has shrunk by 90% for over 60 years [34]. As the environment changes, the area becomes more vulnerable to the impacts of climate security risks including food insecurity, water scarcity, as well as economic and political instabilities.

Moreover, the ensuing problems in the Lake Chad Basin is further worsened by violent conflicts in the region and neighboring countries like Nigeria, Cameroon, and Niger [20]. The Lake Chad area serves as a source of economic opportunities for these four riparian states and more than 40 million people in the Sub-Saharan Africa [40]. Consequently, competition for these limited resources intensifies, with factors such as gender, age, race, and socio-economic class becoming critical determinants for getting access to them. This in turn greatly influences the condition of women in the area.

There is also a growing recognition among climate change researches of the fact that women and children are among the most internally displaced persons by climate security risks, conflict and community clashes [26]. The aforementioned conditions lead to widespread poverty and hunger. Sequentially, food insecurity becomes an issue among these vulnerable populations.

This research develops from clarifying the concept of climate security risks to using theoretical approaches to explain environmental security and feminist political ecology. Then, it examines the impacts of climate security risks on women and children in the Lake Chad basin pertaining to its economic, social and health. Further, with the use of comparative analysis and case studies, it carefully interrogates climate induced displacements and its impacts on women and children.

Moreover, this research aims to help re-strategize the adaptive policies of the government and the inventions of international organizations in addressing climate security risks with coordinated attention to women and children. It hopes to enhance the awareness for women and children in the Lake Chad Basin, to draw support for them from the local administration, international organizations, and support from most non-governmental organizations (NGOs), to withstand and survive climate security risks.

2. Conceptual Framework

Climate change is the active and dynamic variation in the atmosphere such as the temperature, precipitation, humidity, wind and cloud cover of the earth over time. Climate change has always been a challenge to human environment, however, it became a global issue since the 20th century, when the world experienced both the warmest years and the highest number of violent conflicts since the establishment of the

United Nations in 1945 [1, 33]. The climate is afterwards recorded to have been changing drastically than it has ever been, becoming warmer, wetter, and drier.

The change in climate is a gradual process; it develops over years, decades or centuries majorly driven by greenhouse effects. It is often concluded that human activities, particularly the burning of fossil fuels like coal, gas, oil among others have been the primary drivers of climate change in the recent centuries [66].

Climate security therefore is the role and impacts of climate on human security [52]. It refers to the effects of climate induced crisis on peace and security of humans. These effects are worsened in fragile and conflict-affected settings like the Lake Chad Basin. Climate security also serves as 'threat multiplier' to other human insecurities such as economy, food, environment, politics and health causing displacement, death, inequalities and adverse competition over natural resources [64].

Aside threatening the essential ingredients for livelihood like clean water, good health, nutritious food and good shelter, climate changes exacerbate gendered vulnerabilities [46]. In essence, the impacts of climatic variability are reflecting more on women than men because they represent larger percentage of the poor and rely more on endangered natural resources. While climate shocks are stronger on women, it directly affects their children. And seminally, 90% of the people that suffer from severe acute malnutrition in Lake Chad are women and children [63]. To make it clear, climate security risks are specific negative impacts of climate changes like high temperature, high sea level, flood, drought, resources scarcity, insecurities and economic and political instabilities, climate-induced displacements, gendered vulnerabilities and social tension on the people, communities, or a country.

3. Theoretical Framework

3.1. Environmental Security Theory

Change is constant, which is also applicable to human environment. The environmental security theory explains how changes in the human natural environments contribute to diverse insecurities and instabilities. This theory is a complex concept of security; it intersects environmental issues such as deforestation, climate change, pollution, population growth, biodiversity loss, overfishing, drought, desertification and others, with human security concerns such as food, health, education, water, economic, and political wellbeing. It also understudies how all these collide to affect vulnerable populations like women and children.

This theory looks at how climate security risks often serve as the foundation for all environmental problem while aggravating some on the other hand. For instance, as at 2022, an unprecedented rainfall caused flooding that displaced over a million people across Chad Basin [32]. This led to food and water scarcity, economic hardship, death, displacement, health problems and lack of social amenities among the people

especially women and children.

The environmental security theory also looks at the intersection between population growth and environmental changes. Indeed, the neo-Malthusian concept by Thomas Robert echoes the idea that "when there is food surplus, population is bound to increase, however, the increased population consume and exploit the resources (food) till there is limited left causing strain shortages, poor nutrition and hunger" [19]. This ideology reflects that when the population is higher than the available resources, vulnerable groups like women and children have little or no access to economic opportunities and resources which results to poverty, directly extending the impacts to their children. The population occupying an environment is bound to increase in most cases, but when it does not match up with the available resources; vulnerable populations like children and women are at disadvantage and deprived of nutritional foods, clean water, health care service, formal education and safety from abuses and exploitation. Therefore, drastic environmental changes can limit the availability of resources in parity with the increasing population.

Furthermore, climate changes can lead to high rate of pollution which can be soil, air, solid waste or water pollution. For instance, due to climate change, heat wave (which is a form of air pollution) becomes common, thus increasing the rate of air-borne contaminable diseases affecting vulnerable groups like women and children such as measles chicken pox, common cold. Changes in climatic conditions can also affect water bodies, resulting in water scarcity, poor water quality, spread of diseases like diarrhea and cholera, soil erosion and the disruption of aquatic ecosystem.

3.2. Feminist Political Ecology

Political Ecology explores the nexus between power and natural ecological system [44]. Essentially, it looks at how the distribution of natural resources and opportunities such as land, credit, agricultural inputs, decision-making structures, technology, training and extension services of a community is influenced by social stratification factors such as class, education, wealth, age, gender and race. This idea combines human ecology and politics.

The feminist political ecology theory also uncovers the access, role and control the female gender has to quality natural resources in the community. This theoretical framework posits how gender interacts with economic, political and social structures to create women and children's vulnerabilities [16]. It provides clarity into how gender differences are shaped by environmental changes, emphasizing on its impacts on women and children.

Natural resources depletion stands as the primary effect of climate changes and women, on whom the livelihood of their family rests, suffer the most of food crisis and water scarcity. Climate changes such as erratic rainfall decreases the water level therefore making the water body resources limited and water scarce [7, 62]. Consequentially, women that depend on

these resources to trade suffer economic jeopardy.

From the perspective of political ecology, the health risks of climate insecurity show how power relations and resource distribution shape vulnerability. Women and children, already disadvantaged by social stratification factors such as gender, age, and poverty, are largely exposed to pollution, be it from solid waste, contaminated water, or poor air quality, which in turn spreads diseases such as measles, cholera, malaria, yellow fever, poliovirus, and malnutrition [17]. In the same vein, the pressure of climate variability forces many women to prioritize securing food and water for their families over their own wellbeing, including essential maternal health care [24, 10]. Moreover, limited access to healthcare facilities and humanitarian services further reflects how unequal power dynamics and weak governance intensify the risks faced by women and children [8].

Women's restricted access to resources such as land, technology, credit, and decision-making structures leaves them less able to adapt to crises, thereby magnifying their vulnerability [16]. In such situations, women and children are more disposed; domestic violence, sexual intimidation, human trafficking and rape, in addition to experiencing hunger, thirst and poverty. For instance, Ms. Musa - an internally displaced woman - told the Africa Renewal at an interview conducted at a camp for internally displaced person (IDPs) - I was forcibly married to three terrorists at separate times that resulted in three children, the two older children died of starvation in the bush she says, while the last born child was strapped on her back [63]. The scale of this crisis is evident in the Lake Chad Basin, where the International Organization for Migration (IOM) recorded approximately 6,065,751 affected individuals as of July 2023, with internally displaced persons accounting for 53 percent of the total [25].

The environmental security and feminist political ecology theoretical perspectives together helps to understand how changes in the human eco-system such as climate change, population growth, pollution and natural biodiversity loss adversely affect the economy, safety, and health of women and their children. These frameworks also interrogate the effectiveness of environmental sustainability efforts while emphasizing the importance of feminist social inclusiveness.

4. Methodology

This study uses a qualitative research design with a descriptive and analytical approach. It is theoretical in nature and based mainly on secondary data. The purpose is to understand how climate insecurity affects women and children in the Lake Chad Basin and to discuss possible policy responses. Information for this study was collected from different secondary sources, such as academic books, journal articles, government documents, and reports from international organizations like the United Nations, the African Union, and the Lake Chad Basin Commission. These sources provide facts, analysis, and

case examples on climate change, insecurity, and gender issues in the region. The study does not involve fieldwork or data collection from individuals. Instead, it focuses on interpreting and connecting ideas from existing studies. The Environmental Security Theory and Feminist Political Ecology Theory are used as guiding frameworks to explain how environmental problems threaten human security and why women and children are more vulnerable to these effects. The method is interpretive, meaning that it seeks to explain and understand rather than measure or count. It aims to build knowledge and encourage policy discussion on how to protect women and children from the growing risks of climate insecurity in the Lake Chad Basin.

5. Climate Security Risks in the Lake Chad Basin

The Lake Chad is one of the largest freshwater bodies and fish producing area in Africa and it ranks as the 11th largest lake in the world, occupying about the area of 28,000 km² [11,000 sq. mi] in the 19th century [31]. It has an abounding aquatic resource, and its side plain serves as an important irrigated area suitable for agriculture [38, 40]. The Lake is commonly used for animal husbandry, cooking and drinking and at a time was a home for over 30 million people [34].

The Lake Chad Basin is a region which can be described as a 'closed drainage basin'. It is located in the Sahel region, which has an arid climate, and its impact affects several countries, with Nigeria, Niger, Chad, and Cameroon being the direct recipients [22]. This region served and still continue to be a refuge for numerous displaced individuals due to crises in their countries. However, the region has gained greater prominence as a result of rising challenges such as extreme violence, climate insecurity, and poverty, among others. The establishment of the Lake Chad Basin Commission (LCBC), which aims to regulate policies, practices, and agreements among member countries (Nigeria, Chad, Cameroon, Niger, and later Central African Republic), adds to the region's significance [29].

Since the droughts of 1972–1973 and 1982–1984, the region has experienced reduced rainfall and high temperatures, which have significantly reduced Lake Chad's water level [51]. During these periods of drought, Lake Chad shrank dramatically, with its area dropping to about 2,000–5,000 km² [770–1,930 sq mi] [27]. However, more recent studies show that the lake has partially recovered and now fluctuates at much larger extents, depending on rainfall. The survival of the people in the region is reliant on the Lake for various economic activities such as agriculture, fishing, and livestock, but with the current water level having dropped by approximately 90%, many people's livelihoods are jeopardized [31, 20]. In addition to this, the Boko Haram/ISWAP insurgency has heightened the effects of climate change while sponsoring political and economic insecurity in the Lake Chad Region, as

well as poverty [61].

One of the significant climate shock the Chad Basin region faces is water scarcity. The Lake Chad is in a persistent degrading state due to climate changes such as high temperatures, a shift in rainfall patterns, high water demand and inadequate water management. Likewise, the two major sources of Lake Chad, the Chari and Logone rivers, have significantly decreased over the last 40 years [41]. Presently, water-related socio-economic practices like pastoralism, farming, fishery and many more has become nearly impossible because of the difficult access to water. In fact, fish related activities reduced by 60% [4]. Water scarcity also worsens conflict in the Lake Chad Basin, where over 30 million people compete for access to limited water bodies [63]. While also leading to the internal displacement of a lot of people who are in search of water and food. The Chad Basin has been identified as one of the world's most vulnerable regions to climate change because it experiences severe drought and desertification as a result of climate changes. Prior to the drought in the 1900s, the region was a home for many who benefited from the water and its abounding resources from the lake [68]. However, the lake's surface area has decreased by approximately 90%, and the region is now classified as arid due to high temperatures, low precipitation, water scarcity, deforestation, and overgrazing [31]. Often times there are occurrences of wild fire as well as dust storm in the region which have increased because of poor air quality caused by drought. The impact of the drought has also increased the rate of heat and water-borne infectious diseases, food insecurity, heat stroke, heat exhaustion, cholera, dysentery and lots more [9]. Over time, the area experiences severe vegetation loss, wind and rain-induced soil erosion, and infertility or desert soil. With the declining rate of the lake, the National Aeronautics and Space Administration [NASA] predicted that the lake could disappear in about next few decades [35].

Moreover, the Lake Chad Basin showcase geopolitical proximity as one of those factors that exacerbate regional crises and insecurities like armed conflict, displacement, malnutrition, food insecurity, water scarcity and health problems among bordered countries [28]. For instance, in 2009, the Boko Haram armed conflict started in northeast Nigeria and as at 2014, it has spread to the western Chad, northern Cameroon and southeast Niger [39]. These critical problems majorly affect vulnerable groups like women and children as well as call for humanitarian emergency in this region. The Lake Chad Basin experiences difficulties in alleviating these problems because they are transnational and could only be address with the cooperative efforts of countries involved. These situations should be addressed within and beyond borders to create a stable state that is ready for an overall sustainable development.

6. Impacts of Climate Security Risks on Women in the Lake Chad Basin

The role of women in the society and to their family cannot

be overemphasized, but unfortunately the impacts of climate-induced risks fall largely on them. Women are particularly vulnerable to climate security risks because they heavily depend on the productivity of natural resources and agricultural related trade [3]. As a result, they are among the first to experience the adverse effects of climate change. The women in Lake Chad Basin are not exempted from this reality, as climate variabilities worsens their vulnerability and increases inequality.

Among the crucial impacts of climate change in the Lake Chad region is its effect on women's health. The climate condition in the region of extreme precipitation and temperature, aid the spread of diseases, which affects women and children the most. A lot of women battle with severe diseases like diarrhea, malaria, cholera, typhoid, pneumonia, schistosomiasis [snail fever], among others. The common diseases among women in this region are mostly caused by contaminated water and inadequate sanitation facilities [65]. Aside these infectious diseases, many women lack access to maternal healthcare before, during and after child bearing. This causes high maternal and infant mortality. In fact, the Lake Chad basin has 773.4 maternal deaths for every 100,000 live births [42].

Furthermore, the general wellbeing of women is also affected by climate changes in the Chad. Food security is one of the major problems largely experienced by women in the Lake Chad Basin. While women in Chad Basin are mostly responsible for agricultural activities like farming, fishery and water collection in the region, they strive to secure food for themselves and their family [11]. Women in the Chad Basin region suffer food shortage, poor nutrition and widespread poverty [14]. Due to the mercurial rainfall pattern and climate induced drought, some are internally displaced in search of nutritional food, safe shelter and clean water. In this struggle, a lot of women fall victims to sexual and physical abuses which could affects their mental health [42]. For instance, in Niger, 76% of women marry before the age of 18-years while Nigeria and Cameroon both have 30%. [57]. Due to the overall impacts of climate change on women in the Lake Chad Basin, priorities began to change, survival, that is securing food and water has become the utmost preferential needs.

Another climate security risk on women in the Lake Chad Basin is the economic impacts. Many women surviving on businesses that are Lake resources-based, like fishing or water for agriculture or for animal rearing, are in economic danger because of the rigorous climate change risk on the Lake [15]. This leads to economic hardship and poverty among the women in Chad Basin. Also, climate triggered vulnerability exacerbates inequality. Women have limited access to loan and credit loan facilities which could help their businesses. Lack of access to formal education and economic advantages hinder their access to high income jobs that could support them and their families.

Moreover, women's education and empowerment which could have serve as an important tool against climate changes

and its impacts are not well preserved. In consequence of the impacts of climate change, school have been disrupted and the necessary facilities have become damaged [33]. Most importantly, the focus of women has been shifted from empowering themselves to surviving the moment. Being shaped by cultural, social, economic and political factors, women's roles have evolved. Despite facing numerous challenges, they are also responsible for food processing and production, livestock rearing, household chores like cooking, as well as cleaning and childcare.

7. Impact of Climate Security Risks on Children in the Lake Chad Basin

For a proper upbringing of a child, a stimulating environment and overall care is important especially in their early life. However, when children are directly exposed to the impacts of climate change, or indirectly inherit its effects through their parents, particularly mothers, they become part of one of the largest vulnerable groups facing climate security risks [59]. They innocently take part in the adverse effects of climate insecurity endangering their cognitive, present capacities, opportunities, and future ambitions. What is the future of these children going to look like? With these ongoing, rapid and intense increase in the effects of climate change, the lifetime productive potential of a child born in Chad Basin is severely demeaned. The paragraphs hereafter explore some of the impacts of climate change on children in the Lake Chad Basin.

Child Malnutrition is a common impact of climate changes on children in Chad Basin. Agriculture yields in the region are often of poor quality and low nutritional value because of inadequate water supply, limited fertile land, and unfavorable climate condition in the region [18]. In addition, after sales of farm produces, the income parents get, most times, are not sufficient enough to secure food for the family, which in turn leads to malnutrition. This is evident as the Lake Chad region records some of the highest hunger rates in the world, with over 800,000 children in Chad alone suffering from acute malnutrition [21]. Malnutrition leads to several adverse effects, including growth retardation that affects both physical development and mental capacity. An undernourished child may be physically characterized with a thin arms and legs with edema [swelling caused by fluid] belly and face, weight loss, weak immune system and so on [43]. Alongside mental effects like tiredness, low learning capacity, and depression among other. Malnutrition also prone children to death, physical disabilities and illness because of improper feeding, food insecurity, consumption of contaminated food, lack of access to quality food, poverty, and conflict-displacement in Chad Basin. Overtime, research has proven that malnutrition is a violation of the child's human rights.

It's clear that due to environmental land, water, and air pollution, coupled with lack of access to adequate healthcare, there is possibility for high rate of infectious diseases, like

Acute Respiratory Infections (ARIs), cholera, malaria, poliovirus, respiratory infections, hepatitis, measles, typhoid fever, hemorrhage, pneumonia, meningitis, diarrhea, neonatal conditions, malaria and unintentional injuries among children [53]. These conditions consequentially lead to their death or other complications. These health conditions are worsened by the rampant poverty in the Lake Chad Basin, as most parents cannot afford to pay for medical bill nor get effective drugs to cater for their sick child(ren). Although the mortality rate of children in the region under the age of 5-years old is improving, the figures still remain questionable, with Chad recording 102.9, Nigeria - 107.2, Cameroon - 69.8, Niger - 117.3 deaths per 1,000 live births, showing that efforts are still required to provide adequate health care to children [57].

Similarly, the effect of climate changes are also witnessed in the disruption of educational system. Only few children care to attend school while majority of them have totally lost interest in education. Factors like damaged school building and infrastructure, overcrowding in classrooms, lack of funding, shortage of teachers as well as access to vital academic information, materials and equipment, also contribute to affect educational system. As a result, the percentage rate of children who completed their primary education is above average in Nigeria and Cameroon while Chad and Niger are still below 50% [57]. Also, in attempt to make ends meet or share their parent's burden and survive climate affected conditions, children in the Lake Chad Basin often engage in works at the expense of their education. The work conditions are often harsh, illegal, violent and exploitative.

On the same note are the psychological effects of climate security risk on children which are alarming and posing danger to their mental stability. Most of the children in Lake Chad Basin experience mental instability from climate security risks like floods, droughts, wildfire, storms, high rain and heat waves among others. More than emotions, these factors in most cases lead negative mental conditions such as post-traumatic stress disorder (PTSD), hopelessness, phobia, anxiety, depression, sleep disorder, guilt, worry, etc. Consequentially impacting their mind, behavior (how children interact with themselves, their parents, their world and how they express their emotions), mental processes, and academic performance. Besides, climate change effects create a mental health predisposition for adults.

8. Intersections of Vulnerability

From the foregoing, it is evident that climate change effects and social factors such as age and gender, interact to create unique experiences, opportunities and disadvantages for individuals. The degree of the impacts of climate variability however varies between genders and their developmental stages from childhood, adolescence to adulthood [23]. Hence, an attempt is made to offer a comparative analysis of climate impacts on women and children, with particular attention to the ways these impacts are shaped by gender and age. This is done

by examining specific mental, political, health, economic conditions, as well as discriminations and disadvantages that climate change effects leave on women and children.

Climate variability impacts on women who directly depend on agriculture for commerce and food for their household. Adverse impacts of climate change such as unstable rainfall on agricultural produce and sea level further undermine the livelihood of women, making it increasingly difficult for them to sustain their families and economic activities [6]. Other impacts of climate change include; food insecurity, water scarcity, poverty, health complications, displacement and unemployment.

Children on the other hand are innocent or indirectly, recipient of the negative impacts of climate change [56]. Specific impacts of climate change on children include; malnutrition, premature death, disrupted education and empowerment, psychological abnormality, child labor, health issues and diseases [58].

However, it is important to also access that some climate change impacts cut across gender and age in affecting an individual. Impacts such as malnutrition is no respecter of age nor gender, that is, it is common among women and children. Although, considerable attention is on children experiencing malnutrition because it is responsible for the death of many who could not access nutritional foods [30]. Therefore, it is important to note that the influence of climate change on women and children are intertwined. If not properly tackled it could persist through the lifetime of a child as in much the same way they affect the parent.

9. Case Studies and Empirical Evidence

Empirical evidence demonstrates that climate change disproportionately affects women and children, who are often the most vulnerable in times of crisis.

In 2022, flooding in Jigawa state was reported to have destroyed more than 250 schools and healthcare facilities [49]. Instance as this reflects the damage unpredictable climate change does to educational system and health care system. Not only that, according to UNICEF, about 800,000 children were displaced due to this 2022 flooding in Nigeria [60].

In the arid southern province of Lake Chad, the daily struggles of nomadic communities further reveal the gendered dimensions of climate change. A 34-year old herder, Fatime Tchari, a mother of four, described how she and a group of 50 nomads with 450 cattle were forced to migrate in search of grazing land, fleeing villages overwhelmed by rising water levels and humidity [45]. The women express their concern on milk shortage and the situation of their cows in the temporary camp. Fatime lamented "As you have just seen, I tried to milk six cows but I have not managed to get a liter of milk. The cattle are stressed, sick and malnourished because of the drought and floods". She also added "last year we saw our cows starve to death before our eyes, this year we are facing another disaster. We need food and vaccines to preserve our

herds or we will end up losing everything".

Occurrences in Chad also reveals this pattern. N'Djamena, the capital of Chad, witnessed the heaviest rainfall occurrence after a very prolong drought of over 30 years, which led to heavy flooding, navigable only by boat [13]. Among the victims was a four month old girl with a scale of 3.3 kilograms, who was left to survive with a tube inserted into her nostrils in an hospital in N'Djamena that specializes in infant malnutrition [5].

Furthermore, in 2018, Mariam, a mother of seven, was forced to leave her husband's fishing livelihood on Lake Chad after persistent water decline made survival impossible. The family returned to their native village of Bari Dina in search of food and water [2]. This fact exemplifies displacement as a result of climate conditions. Similarly, Sadia, another mother in Batha, struggled to feed her malnourished 10-month-old daughter after displacement left her unable to provide either adequate meals or medicine [2]. Awa, a mother of eight, now works as a day laborer in a market gardening group alongside her husband to provide for her family, while her two-year-old son continues to suffer from malnutrition [2].

The crisis also affects women directly. In 2022, 25-year-old Abdoulaye Haoua, a market seller, described how poverty and lack of food left her unable to feed her child. *"I do not have enough money to feed him. I lost my first child because of malnutrition, and I do not have the means to give him anything other than breast milk."* Moreover, her own state of malnourishment meant that the milk she provided lacked sufficient nutrients [36].

Health centers across the region confirm the widespread scale of malnutrition. In Amma, a village in the Lac province, 59 cases of child malnutrition were reported as of March 2024. One such case was Alima, an infant whose mother died during childbirth. Cared for by her grandmother, Alima suffered breathing difficulties and constant pain but received therapeutic milk and peanut paste as treatment [56].

In Hadjer Lamis, another mother, Mariam Abdoukarim, brought her baby to the N'doukouri health center after he was diagnosed with malnutrition for the second time. She explained that a poor harvest left her with nothing to feed him. Despite receiving treatment from Médecins Sans Frontières, the child also developed diarrhea and struggled to breathe [47].

These case studies provide critical evidence to underscore the linkage between climate change and the vulnerabilities of women and children. Thus, this analysis also calls for strategies that specifically examine and address the impacts of climate change from the standpoint of women and children's experiences and conditions.

10. Policy and Intervention Strategies

10.1. Existing Policies Addressing Climate Security and Vulnerability

In response to the growing climate and security challenges

in the Lake Chad Basin, a number of regional and international policies and initiatives have been developed to promote peace. For instance, the Lake Chad Basin Commission (LCBC), an intergovernmental organization in the Lake Chad Basin launched the Regional Strategy for Stabilization, Recovery and Resilience (RR SRR) in 2018, which was later revised in 2024. The RR SRR was developed to address challenges in the Lake Chad Basin. It supports cross border cooperation and initiatives to achieve sustainable development [55].

To further solidify this agenda, the 5th Lake Chad Basin governors forum was held from 29th-31th January 2025, jointly hosted by Yobe state government, the African union, and UNDP in Bornu state, Nigeria. It was intended to promote peace, justice and strong institutions (Goal 16) and encourage partnerships for the goals (Goal 17). It addressed topics like community and local development, crisis response and sustainable development among others [57]. Also, the special multi-partner delivery fund (SMDF) and the nexus funding facility (NFF) was launched with the collaboration of Lake Chad Basin Commission (LCBC), United Nation Development Programme (UNDP) and other partners to enhance resilience, peace and sustainable development. The SMDF supports regional strategy for the stabilization, recovery and resilience (RS SRR) while the NFF introduces humanitarian, development and peacebuilding (HDP).

In the same vein, the 3rd Lake Chad Basin high level Conference which was organized between the period of January 23rd-24th, 2023 at the Mahatma Gandhi International Convention Centre (MGICC) in Niamey, Niger, also sought to address the multidimensional challenges in the Lake Chad Basin [37]. This conference complements the Lake Chad Basin Commission (LCBC) promoting regional collaboration, peacebuilding and sustainable development in the Lake Chad Basin.

In the bid to also curb climate change effects, the Regional Stabilization Facility, a funding initiative was launched in 2019 by United Nation Development Programme in collaboration with international donors and partners in the Lake Chad Basin for infrastructural recovery, security and peacebuilding. Since then, this initiative has reached over 726,222 women [54].

10.2. Recommendations for Improving Support for Women and Children

On the basis of the findings of this research, here are the recommendations that provide sustainable, adaptive, resilience-building and appropriate support to women and children.

- 1) Empowerment should be provided to rebuild and gain control of the future. Through the enhancement of education and skills acquisition programs in Lake Chad Basin.
- 2) Gender equality is a key response to climate change. Women's priorities and needs must be considered and reflected in the development planning and funding.

- 3) Specific gender effects of climate change should be tackled; including sexual abuses, early marriage, pregnancy health etc.
- 4) Adaptation initiatives should be identified and employed. Specifically, highly equipped health centers, as well as water and sanitation infrastructures.
- 5) Gender inclusiveness in the economy, social and technological development.
- 6) Agricultural practices and income generating activities should be promoted.
- 7) The prevention of illicit dumping of toxic and hazardous waste as well as the prevention and mitigation of erosion and desertification.
- 8) Hygiene services promoting health and well-being in combating diseases.
- 9) Frequent screening, vaccination campaigns and awareness like the screening for malnutrition and malaria.
- 10) Conservation and protection of biological diversity by the government to prevent overexploitation, degradation and to equally provide it necessarily to the people.
- 11) Climate-resilient agricultural techniques and skills should be adopted for easier agricultural practices. Climate-resilient such as market gardening, nursery techniques for seedlings and seasonal farming could be considered.
- 12) Climate awareness should be promoted as well as its impacts on well-being and the adaptive measures to survive the condition.
- 13) To reduce the possible climate psychological repercussions on vulnerable groups, mental health care services should be available in the Lake Chad Basin for mental health consultations and follow-ups.
- 14) Information sessions and cooking demonstration to further tackle malnutritional and food shortage e.g. Awa learnt how to prepare porridge with flour. Many other women can also learn to effectively prepare nutritious food for their family.
- 15) Provision of temporary relief items like Insecticide treated mosquito net, jerry cans, kitchen utensils, blankets and hygiene items.

10.3. Role of Local and International Organizations

These are the outlined roles of local and international organizations.

- 1) Conducting survey, collection of data of vulnerable populations in order to come up with an exclusive and accurate strategies.
- 2) Raising awareness at the local and international levels and creating linkages between them.
- 3) Providing humanitarian services to affected individuals in the Lake Chad Basin.
- 4) Implementation of long-lasting policies and projects. In this case, the Lake Chad Basin Commission (LCBC), an

intergovernmental organization in Lake Chad Basin established in 1964. This commission embarked on a multi-billion project to implement a long lasting to the Lake and combat the aggravating poverty among the people in Chad Basin.

- 5) Community based resilience strategies. For instance, the WFP Youth networks for the lack chad region.
- 6) Fund aid and donation.
- 7) Provision of temporary relief measures.

11. Conclusion

Climate change has serious effects on women and children in the Lake Chad Basin, affecting their jobs, social roles, education, health, and overall wellbeing. This study shows that these problems are not just caused by environmental changes but are made worse by inequality, weak governance, and regional insecurity. Using Environmental Security Theory and Feminist Political Ecology, the research explains how climate risks affect women and children differently because of their age and gender.

An essential contribution of this study is its policy focus. It shows how existing regional and international programs, like those of the Lake Chad Basin Commission, can be improved to better meet the needs of women and children. The study also gives practical suggestions, such as promoting gender-sensitive programs, climate-smart farming, better healthcare, and mental health support. By combining theory with real examples and case studies, this research fills a gap between academic studies on climate change and practical solutions. It shows that dealing with climate insecurity in the Lake Chad Basin needs teamwork from local communities, governments, and international organizations. Overall, the study helps us understand how climate change worsens social problems and offers guidance for policies and programs that can protect and empower women and children in the region.

Abbreviations

ARIs	Acute Respiratory Infections
AFDB	African Development Bank
DCCEEW	Department of Climate Change, Energy, the Environment and Water
FOA	Food and Agriculture Organization
HDP	Humanitarian, Development and Peacebuilding
IDPs	Internally Displaced Persons
IOM	International Organization for Migration
ISWAP	Islamic State West Africa Province
LCBC	Lake Chad Basin Commission
MGICC	Mahatma Gandhi International Convention Centre
NASA	National Aeronautics and Space and Administration

NFF	Nexus Funding Facility
NGOs	Non-Governmental Organizations
OCHA	Office for the Coordination of Humanitarian Affairs
OHCHR	Office of the United Nations High Commissioner for Human Rights
PSTD	Post-Traumatic Stress Disorder
RR SRR	Regional Strategy for Stabilization, Recovery and Resilience
SMDF	Special Multi-Partner Delivery Fund
UN	United Nations
UNDP	United Nation Development Programme
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organization

Conflicts of Interest

The authors declare no conflicts of interest.

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