



Women and Girls' Vulnerability to Climate Change: Gender-Based Policy Strategies for Sustainable Development

Ugwu Chioma Scholastica^{a*} and Lawal Olanrewaju^b

^a *Department of Political and Administrative Studies, University of Port Harcourt, Rivers State, Nigeria.*

^b *Department of Geography and Environmental Management, University of Port Harcourt, Rivers State, Nigeria.*

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/ARJASS/2022/v16i230283

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/84069>

Review Article

Received 07 December 2021

Accepted 10 February 2022

Published 12 February 2022

ABSTRACT

Climate change which is a change in weather taking the form of rising sea levels, shifting rain patterns, drought and flooding affect both men and women. However, the impacts of climate change on these sexes differ just as their expected roles in the society differ. Female folks face the brunt of climate change more than their male counterpart due largely to their differentiated roles; sources of livelihood, level of education which combines and shape their abilities to cope with climate change impacts. From all indications the Nigerian government's climate change policy has not acknowledged the different impacts of climate change on male and female sexes to incorporate gender-based policies and programmes to boost women and girls' ability to cope with climate change vulnerability. The paper aims at examining the impact of climate change on the female gender, and recommends the incorporation of a gender-based approach in the national policies and programmes to ease the impact of the changing climate on the female folks for the attainment of sustainable development and better livelihood.

Keywords: *Climate change; climate change impact; gender-based policy; sustainable development; women and girls vulnerability.*

1. INTRODUCTION

Climate change has been globally identified as a major threat facing human existence. The short term effects of climate change occur in the form of natural hazards, such as landslides, floods and hurricanes; and in the long-term, it takes a gradual process of environmental degradation [1], impeding all areas of life such as agriculture and food security; human health and water resources, ecosystems and biodiversity, energy, human settlements, and migration patterns as well as transport and industry [1,2,3].

The impact of climate change affects all individuals, however, the poor and other marginalized groups in the society such as women, girls, the elderly, immigrants and indigenous groups among others are more vulnerable. This is so because their livelihoods are often highly reliant on natural resources which are vastly regulated by climate variability [4]. Climate change exerts different impacts on different sexes. Current studies have established that climate impact and vulnerability on individuals are gendered [1, 5, 4, 6, 7-11].

Female folks have been identified as one of the most vulnerable groups affected by climate change. This is due to differentials in the societal ascribed roles and power relations. Some other reasons hinged on their sources of livelihood, level of income, poor assets, land resources, economic power, political engagements, training, and skills which impact their ability to cope with the menace of climate change [2, 12, 8, 9, 11]. Differences in roles of males and females including their access to resources, level of education guarantee diverse opportunities, and capabilities to cope with the challenges of climate change [13]. The Building Nigeria's Response to Climate Change (BNRCC) [14] specifically highlighted that women are more vulnerable to climate change impacts in Nigeria because they constitute the majority of the poor and their livelihood are more natural resources-dependent.

Complimenting BNRCC's submission, the Center for International Forestry Research [15] (n.d) highlighted three major reasons responsible for women's vulnerability to the impacts of climate change to include limited access and control over resources essential to adaptation, poor involvement in decision-making processes, and lack of equal opportunity to productive resources required for agricultural livelihoods. From the foregoing, women appear to bear the brunt of climate change impact which tends to exacerbate

their poverty level. It is unfortunate that in spite that women constitutes about 49 per cent of the world's population, they constitute the world's poorest group yet they are underrepresented in decision making and policy design positions to contribute to development agenda which can help them cope with the consequences of climate change. The world over, women are marginalized in various facets of life including political and economic power with limited access to financial and material resources which further exacerbate their susceptibility to the consequences of climate change [5, 16, 8, 17].

To underscore the significance of women in climate change response, Nachmany, Fankhauser, Davidová, Kingsmill, Landesman and Townshend [18] noted that climate change should be addressed within the framework of sustainable development. This implies that climate change response should be sensitive to issues of equity, gender, youth, children and other vulnerable groups in the society. The issue of gender equality and women's empowerment were also captured in the 2015 Paris Agreement which urged member states to adopt gender-responsive approaches towards adaptation and capacity-building efforts [8].

It further acknowledged the importance of women in achieving sustainable development when it noted that, there cannot be genuine sustainable human development without gender equality. In the same vein, the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), adopted in 1979 linked women's sustainability to climate change impact in its framework. The framework provides for the advancement of gender equality to enhance women's ability to cooperate with their men counterparts in the development agenda of nations.

Although discussions on the issue of climate change both at the national and international arena has often been about pollution mainly resulting from industrial activities, however, the incorporation of the gender impact of climate change in top agenda of mitigation and adaptation strategies, and policies of national and international governments remain crucial for the attainment of a sustainable future. It is pertinent to note that for sustainable development to be achieved, climate adaptation strategies must focus on women. This is because they form a majority of the global poor and are more impacted by climate change as they rely

majorly on the natural environment for their livelihood.

Presently, there seem to be limited or no proactive efforts by the Nigerian government towards integrating gender-sensitive strategies to unravel the challenges posed by climate change on the female folks. This could be attributed to a lack of understanding of these impacts on this vulnerable group and the challenges they pose to the attainment of SDGs. It is on this premise that this paper examines women and girls vulnerability within the context of climate change to expose the major challenges they encounter in the event of climate variability. The paper would also provide adequate strategies on how gender-based climate related-issues can be integrated into national policies and programmes to attain sustainable development and better living.

2. WOMEN AND GIRLS IN THE CONTEXT OF CLIMATE CHANGE

The impact of climate change is felt the world over. However, the question of which group is mostly affected can be defined by the differences in the social stratification in society. It is on this note that the United Nations Development Programme (UNDP) (2013) noted that the degree to which people are affected by climate change is derived from their status including sex, poverty level, power, access to land and property as well as their control over such resources. The effect of climate change on individuals correlates with the environmental, economic and socio-cultural context in which they find themselves.

Centre for International Forestry Research (CIFOR) [15] in recognizing the unequal effects of climate change on individuals opined that women bear the burden of climate change impact as they are the most vulnerable to its negative effects. To further buttress the vulnerability status of women in a changing climate world, GIWPS [16] stated thus:

The impacts of climate change – drought, floods, extreme weather, increased incidence of disease, and growing food and water insecurity – disproportionately affect the world's 1.3 billion poor, the majority of whom are women. Although women are forced to bear the brunt of the consequences of climate change, they have been systematically excluded from decision-making mechanisms and denied agency in deciding when and how to overcome the vulnerabilities they face (p. 15).

Women's positions in the family and the political arena undermine their ability to tackle the challenges meted out on them by climate variability. These limitations further exacerbate their poor economic status and make it more difficult for them to cope with the harsh condition of climate change. A UNDP report revealed that women have limited access to funds to cover weather-related losses or adaptation technologies and, they experience discrimination in accessing land, financial services, social capital and technology [8]. Neumayer and Thomas [19] noted that climate change aggravates women and girl's poverty cycle and vulnerability, and places them at greater chances of dying during and after the prevalence of disasters. Majority of women lack access to information with regards to the occurrence of natural disasters such as floods, earthquakes, cyclones, tsunami, etc.

Women and girls lack the skills that can help them cope in the event of a disaster such as swimming and climbing trees among others [10]. A report by UNDP has it that 80 per cent of people displaced by climate change are women, and more than 70 per cent of those who died in the 2004 Asian tsunami were women. It was also reported that Hurricane Katrina, which struck New Orleans (USA) in 2005, affected majorly poor African Americans, particularly women, while two million women and children at least four in every one minute die prematurely as a result of illness mediated by indoor air pollution, arising from smoke during cooking using solid fuels [8].

It is evidenced from the literature that women are more vulnerable to the impact of climate change than men. These pieces of evidence are even more obvious when comparisons are drawn between female and male-headed households in the event of climate-related distress. Most studies reveal that households headed by women are more likely to incur greater losses in climate risk cases than their male counterparts. Low-income women and female-headed households have been identified as key groups vulnerable to climate change. They face undue difficulty in adapting to changing circumstances resulting from climate change as a result of inequality to access to and control of land, household responsibility including the burden of fetching water and fuel woods as well as poor education [17].

Women face various kinds of vulnerability arising from the impact of climate change. Some of

these challenges are physical, emotional/psychological, economic, ecological, political and social [10]. This is because women's roles as caretakers and caregivers in a normal household setting make their households rely largely on them. Thus, in the event of climate crises such as floods, earthquakes etcetera which hamper women's resources and sources of livelihood, they become more vulnerable in the above-mentioned areas.

Physical vulnerability refers to injuries sustained by women as a result of climate disorder like earthquake and flood which sometimes leads to death. The emotional vulnerability occurs when as a result of climate risks women are psychologically or emotionally thrown off balance as their sources of livelihood are affected. They may experience fear, anxiety and frustrations which can lead to miscarriages, lack of sleep and health instability. Economic vulnerability is a situation of resource scarcity resulting from climate change impact. Since the majority of the poorest population are women and are mainly engaged in agriculture as their source of livelihood, climate disorder leading to flooding, environmental degradation which results in loss of or unlimited crop and livestock yields usually lead to poor finance thus, resulting in an untold hardship of affected households.

Vulnerability in terms of socio-political resulting from climate impact occurs when individuals especially women are deprived of their economic power due to poor farm output thus, limiting their

opportunities to freely socialize and participate actively in politics. This is so because; lack of economic base or its limitation has a direct relationship with the social and political lives of individuals. Rural women who are engaged / interested in local politics may not be able to cope as a result of their limited socio-economic power. Fig. 1 highlights some of these challenges (women's vulnerability to climate change) and the effects on women.

2.1 Sectoral Dimensions of Women's Vulnerability to Climate Change

Women's vulnerability to climate change is better appreciated when x-rayed into sector areas. There are various areas in which climate change majorly affect women and girls. These include:

2.1.1 Health

Climate change poses high health risks to the population, especially the vulnerable. Groups such as children, the poor and women are most affected with health challenges as a result of climate variability. The extreme temperature associated with heat waves and cold snaps can exacerbate mortality rates, mostly among the elderly and persons with health challenges. Rising ocean temperatures may result in increased cholera outbreaks due to more intense Algal blooms [20]. This may as well increase the transmission of malaria in some locations, which already causes 300 million acute illnesses and kills almost 1 million people yearly [21].

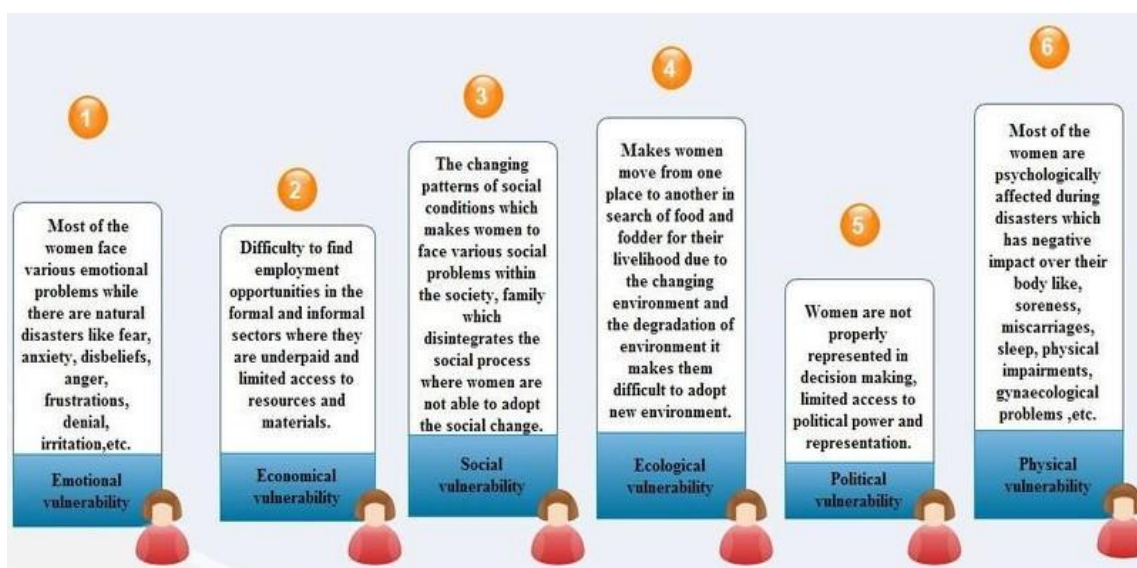


Fig. 1. Vulnerability faced by women during disaster and climate change

Source: Adapted from Dimitrov [10]

Some of these health conditions may result in death. Although majority of deaths that occur as a result of climate change are caused by natural disasters triggered by climate instability. Death rates during disasters are higher among the vulnerable including women, children and the elderly. Many studies reveal that despite that disasters exert negatively on the population, women have a higher tendency of dying than men. For instance, the 2003 European heat wave claimed more women's lives than men [22]. More so, the 1991 cyclone disasters in Bangladesh showed that out of a total of 140 000 lives lost, women constituted about 90 per cent of victims [23]. In the same vein, during the Asian tsunami in 2004, 70 per cent of the victims were Women [8], while in 2008, Cyclone Nargis which occurred in the Ayeyarwady Division of Myanmar had 61 per cent of 130, 000 persons dead or missing of whom were women [24].

Health issues such as infectious vector-borne disease, malnutrition and poor sanitation are likely to intensify due to climate change [20, 10]. Women and especially children in the rural areas are the worst hit with cholera and malaria due to contaminated and stagnated water [25]. Pregnant women and breastfeeding mothers are more likely to face nutritional deficiencies owing to their unique nutritional needs. For instance, in South Asia and South-East Asia, about 45-60per cent of women within their reproductive age are underweight while 80 per cent of pregnant women lack adequate iron [26]. In sub-Saharan Africa, in spite that women are overburdened with loads, they have lesser consumption of calories than men as cultural belief promotes more food intake by men [27]. Poor nutrition especially among women and girls may result in challenges during pregnancy, low birth weight, and pre-natal mortality among others [20].

Climate change resulting in droughts exacerbates food and water scarcity which leads to famine. In the period of the dry season, it has been reported that in rural India and Africa, women expend about 30 per cent or more of their daily energy intake fetching water. Carrying such loads on the head over a long period affects the neck muscles, the spine and the lower back resulting in early ageing of the vertebral column [28,29]. Apart from the above health implications, bad water sources are unsafe for healthy living.

Floods associated with climate change further exacerbate the prevalence of water-related diseases, which affect the majority of the poor

population [10]. Serious illnesses can be contracted through the consumption of unclean water as a result of water scarcity arising from climate change. Lack of access to safe water increases the risk of diarrhoea and other diseases related to chemical and biological contaminants [20]. Incidence of infectious diseases such as malaria, cholera, onchocerciasis, diarrhoea, schistosomiasis and dengue fever are common diseases associated with climate and weather change [30,1,11].

2.1.2 Water and sanitation

Access to good water is one of the major challenges facing vulnerable groups including women in the event of climate change. Climate change occurring in the form of floods and drought present occasions of contaminated water and lack of water needed for household consumption. In the event of such a situation, women and girls are most affected because they are depended on by the whole household. Every aspect of household responsibility that requires water often fall on the women including making available drinking water, food preparation, washing and cleaning of the house, among others. These burdens are exacerbated in the event of flood which contaminates sources of water supply especially to rural women and their households thereby making it difficult for them to access clean water.

In the case of drought, women and girls are confronted with the challenges of accessing water close by as most small streams within their settlements may dry up thereby putting undue pressure on them in search of bigger streams which may be a long distance from their homes. The pressure of searching for water for household consumption can undermine girls' academic progress as they may be forced to withdraw from school or reduce regular attendance to ease their mothers of the burden of getting water.

Studies have shown that in some parts of Africa, women and girls spend not less than eight hours daily fetching water. The water so collected may not sufficiently satisfy the needs of the household and is most often contaminated. This situation throws women and girls into a state of poor sanitation and hygiene deficiency [1] which may result in unhealthy conditions such as skin irritation, scaly and hard skin which often make them face some sort of stigmatization among the people. Contaminated water has also been

proved to be connected to diarrhoea which results in a high rate of death, especially in children. At least 1.8 million deaths occur from approximately 4 billion cases of diarrhoea each year for which about 90 per cent of these deaths are children in the age bracket of five and mostly from developing countries. The report has it that 88 per cent of these deaths are credited to unclean water, poor sanitation, and inadequate hygiene [31].

Another water-borne disease such as typhoid is caused by ingestion of *Salmonellatyphi* bacteria in food or water. This disease affects about 17 million people yearly, resulting in about 600,000 deaths. Women and children are more vulnerable to these diseases and more likely to die in such cases because they are more exposed to unclean water. Pregnant women have also been found to be particularly vulnerable to hepatitis E, which occurs mainly in epidemics caused by monsoon rains, heavy flooding, and contamination of well water with approximately 20 per cent mortality rates [32].

2.1.3 Agricultural production

The majority of the world's poorest population depends on natural resource activities as their main source of livelihood. Studies by Food and Agricultural Organisation (FAO) (2009) stated that about 80 per cent of the world's undernourished people rely on agricultural activities for their livelihood while about 75 per cent of the world's poorest family units directly or indirectly are dependent on farming or fishing as their resource base and sources of survival. Women constitute the world's poorest group and the majority of the rural women depend solely on farming for their family sustenance. The majority of the rural populace depends on forest resources for food, firewood, fibre timber, craft materials, animal fodder, and medicinal herbs, for which women are the major harvesters [16]. Furthermore, women produce between 60–80 per cent of the total food in developing countries yet they own between 10-20 per cent of farmlands globally (UN WomenWatch, 2009; FOA, 2011; FOA, 2015), and the least fed in the period of food scarcity. Climate change has enormous negative impacts on agricultural production. Low land productivity resulting in poor food production and crop yields are experienced in periods of limited rainfall as soils dry up.

On the contrary, heavier rainfall results in an overflow of rivers leading to increased flooding

and erosion [33]. When floods occur, farmlands are submerged consequently causing poor agricultural yields. National Emergency Management Authority (NEMA) revealed how the 2012 flood disaster in Nigeria reduced agricultural production in 23 states. Deforestation which occurs due to forest clearing and results in loss of tree cover, increases soil erosion, leads to decreased agricultural productivity and as well raises the burden of collecting forest resources and water.

The study by BNRCC in Quadri & Amaechi [9] showed that the Wula Ekumpuo community in Cross River State, Nigeria experienced poor agricultural yield as a result of deforestation. Food shortage and water scarcity were some of the findings from the study affecting the community. Limited food supply was caused by poor soil quality which may have been a result of flood effects. In the event of flood or drought, women farmers' source of livelihood suffer as their farms are washed away by flowing water or their lands are dried, whichever case, undermine their farm produce and further throw them into food scarcity and poverty.

The reported case by Ibekwe [34] following the impact of the 2012 flood in Nigeria shows that many states were affected. According to the report, many communities were submerged including farmlands. In Bassa local government area of Kogi state, for example, acres of yam farms were affected while in Cross River state, cassava, yams, maize, melon, cocoa, plantain and banana farms were submerged and destroyed by flood. In these events, women are mostly affected because the majority of them in rural areas are subsistence farmers with limited resources to farm. Some of these women are female-headed housewives with little or no support in fending for their households.

2.1.4 Migration and displacement

Climate-related disasters do increase the migration of people and most times lead to displacement. Climate change resulting in desertification and drought can lead to loss of livelihoods and displacement of people from one degraded ecosystem zone to another [33]. Persistent flooding or amplified salination may compel population displacement and increase the vulnerability of populations [20]. It is estimated that about 80 per cent of those displaced by climate change are women [8]. Approximately, 26 million out of the 60 million

people that are displaced across countries of the world are on account of climate-related disasters [35, 36], and not less than 1 million persons are displaced each year [37].

In 2018, about 28 million persons were newly internally displaced either through disaster or conflict. Out of which 61 per cent or 17.2 million persons' displacement were caused by disasters. Among the countries most affected were Ethiopia, Nigeria and Afghanistan. While about 16.1 million persons left their original homes due to extreme temperature, insufficient food, drought and storms [38]. A study of women in Bangladesh by Azad, Hossain, and Nasree [39], found that about 61 percent of those surveyed were evicted from their original homes in the event of severe floods. In the event of these crises, women and girls are mostly affected.

Climate-related displacement has also been found to exacerbate sexual harassment and exploitation of underage, overcrowding and poor living condition [40,41]. The World Disaster Report affirms that during disasters, women and girls are prone to greater risk of sexual violence, exploitation and abuse, trafficking, and domestic violence (International Federation of Red Cross and Red Crescent Societies [IFRC], 2007). For instance, the study by Azad et al., [39] revealed that 35 per cent of Bangladesh women experienced sexual harassment by a male relative or acquaintance after the flood event as a result of increased stress and social disruption. In addition is loss of dignity, children out of school, loss of employment and source of livelihood which may result in a psychological disorder.

Desertification and drought also lead to displacement of people from one degraded area to another [40]. The 2012 flood in Nigeria which affected many states across the country led to the displacement of people from their original homes. The flooding affected 25 out of 36 states, displaced about 3,871,063 persons and destroyed 597,400 homes [42,43]. Ibekwe [34] reported that in Kogi State, more than 500 thousand people were displaced and 9 of the 21 LGAs were affected.

In such events, the majority of the displaced are the vulnerable population usually women and children. Rural-urban migration is mostly caused by temperature and rainfall variations which undermine subsistence farming, adequate water supply and peoples' income level among others.

Floods escalate unemployment since it displaces people from their residence and workplaces [39]. Other forms of migration result from conflict. Most migrations are caused by circumstances and disconnect people from their social life as well as their immediate environment leading to socio-economic and psychological trauma.

3. SUSTAINABLE DEVELOPMENT AND WOMEN'S CLIMATE VULNERABILITY: INTERPLAY

The linkage between sustainable development and climate change especially concerning women and girls is better appreciated when Sustainable Development Goals (SDGs) are viewed within the context of climate impact on the vulnerable population particularly women and girls. In the event of climate change, the achievement of core SDGs that focus on changing the status of most female gender by 2030 is most likely to be undermined in terms of poverty and hunger, health, equality and empowerment, water and sanitation.

3.1 SDG Goal 1: Ending Poverty in All Its Forms Everywhere

This goal focuses on building resilience for the poor and those in vulnerable situations and reducing their exposure and vulnerability to climate-related extreme events and other economic, social, and environmental shocks and disasters. As earlier noted, women and girls constitute a majority of the poor population globally and nationally, thus, the impact of climate disruption is a challenge to the achievement of this goal hence, the majority of this vulnerable population depends on their natural environment which is highly jeopardized during climate obstruction.

3.2 SDG Goal 2: Ending Hunger, Achieve Food Security and Improved Nutrition, As Well As Promote Sustainable Agriculture

This goal aims at ensuring sustainable food production systems and implementing resilient agricultural practices that would increase productivity and production, maintain ecosystems, strengthen capacity for adaptation to climate change including extreme weather, flooding, drought, and other disasters, as well as improve land and soil quality are at high risk of being attained with continuous climate upturn for

which women and girls are most vulnerable as they depend highly on agriculture.

3.3 SDG Goal 3: Guarantee Healthy Lives and Promote Wellbeing for All of All Ages

The goal focuses to attain universal access to sexual and reproductive healthcare services, medicines and vaccines, and significantly reducing the rate of mortality and illnesses resulting from hazardous chemicals and environmental pollution and contamination. The achievement of this goal is threatened by climate alteration which exacerbates peoples' health conditions and in some cases results in death. In such climate events, women and girls are more vulnerable.

3.4 SDG Goal 5: Achieve Gender Equality and Empower All Women and Girls

The focus of this goal is to end all forms of discrimination against women and girls in both public and private spheres. End all forms of violence against female folks including trafficking, sexual exploitation, child/early and forced marriage, and female genital mutilation. It also aims at guaranteeing women's equal opportunities for leadership positions at all levels as well as ensuring their equal rights to economic resources including access to ownership and control of land and other forms of property, financial services, inheritance, and natural resources, following national laws, and promote women's empowerment. All of these sub-goals under goal 5 are also at risk of being achieved within the estimated period with climate variability which continues to undermine women and girls progress in all spheres of life.

3.5 SDG Goal 6: Guarantee Availability and Sustainable Management of Water and Sanitation for All

Achieving universal and equitable access to safe and drinking water, sanitation and hygiene for all and particularly to women and girls and those in vulnerable situations continue to be under threat in the event of climate change. The occurrence of flood which washes away surface ground, farmlands and carries all forms of dirt into streams further heightens the risks of contaminated water and good hygiene. Climate change events pose danger for the attainment of this goal and places women and girls at greater risks of poor sanitation and safe drinking water.

All of the above five core SDGs cannot be attained if appropriate gender-sensitive strategies are not incorporated into the national climate mitigation and adaptation policy and give women an opportunity to contribute to women and girls.

4. CONCLUSION

Climate change is a change in weather that affects everyone but exerts different impacts on different sexes. This is due to differentials in the societal ascribed roles and power relations, sources of livelihood, level of income, assets and education; access to land resources, economic power, political engagements, training, and skills possessed by these sexes. Women and girls have been identified to be more vulnerable to the impacts of climate change. This is due to their limitations in the above-listed aspects of life which combine to weaken their ability to cope with the menace of climate change. To achieve sustainable livelihood, climate change policies and programmes must incorporate gender-sensitive issues capable of mitigating the effect of climate change on women. This is because women and girls constitute a majority of the poor and depend largely on natural resources which are largely affected by climate variability. Thus, incorporating their challenges and needs with climate change in national policies is imperative to the achievement of sustainable livelihood.

5. POLICY STRATEGIES FOR WOMEN'S VULNERABILITY TO THE IMPACT OF CLIMATE CHANGE IN NIGERIA

In spite of that many nations are having a better understanding of the need to incorporate gender perspectives into climate change policy, there still exist gaps in the policy strategies and processes which undermine the achievement of desired goals. However, to achieve sustainable development, gender sensitive approach must be designed and incorporated into the national mitigation and adaptation policies to tackle the challenges faced by women and girls as a result of climate-related events. In line with this, the following policy strategies are recommended.

Review of existing climate policies and programmes as well as the National Development Plans to incorporate gender perspectives into these national policies for sustainable development. Combating climate change-related events needs consultations with both men and women. But since women are

more vulnerable to the impact of climate change, their skills, knowledge and experiences must be incorporated during the policy processes. Women's involvement would provide better insights into their problems and needs, and provide opportunities for improving all sectors affected by climate change with clear adaptation programmes capable of cushioning its impact.

Government and its agencies in climate-related and environmental sectors should prioritize and accelerate the implementation of climate policies, especially in gender-related areas. Designing and incorporating gender-sensitive issues should not only end in policy formulation but taking actions towards its realization is central to achieving the desired goal. Thus, government and its agencies should take the implementation of climate policies as serious as making the policy and, as well involve a greater number of women in the process to ensure that policy intent is achieved.

Government and its climate agencies should provide training opportunities for communities particularly women to sensitize and educate them on the impact of climate change, where to report their climate experiences, and how to overcome these challenges.

Adaptive actions must be geared towards building up women's assets base. Since the level of assets possessed by individuals determines to a large extent the impact of climate-related events on them, adaptation programmes must take into consideration how to improve the productive resources of women including access to land, credit facilities, and technology among others to help them cope easily with climate impacts.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

- UN Women Watch. Fact sheet: Women, gender equality and climate change; 2009. Accessed June 20, 2021 Available:http://www.un.org/womenwatch/fature/climate_change/
- World Bank. Social dimensions of climate change: Equity and vulnerability in a warming world. Washington, D.C.: World Bank; 2010.
- UNDP. UNDP and climate change: Zero carbon, sustainable development. New York: UNDP; 2015.
- UNDP. Sustaining human progress: Reducing vulnerabilities and building resilience. New York: UNDP; 2014.
- MacGregor S. Gender and climate change: From impacts to discourses. *Journal of the Indian Ocean Region*. 2010;6(2):223-238.
- Morchain D, Prati G, Kelsey F, Ravon L. What if gender became an essential, standard element of vulnerability assessments?. *Gender and Development*. 2015;23(3):481-496.
- Orielle LO. Why women are central to climate justice and solutions; 2015. Accessed June 20, 2021 from <<http://ecowatch.com/2015/09/24/women-climate-change/>>
- UNDP. Gender and climate change: Overview of linkages between gender and climate change. New York: UNDP; 2016.
- Quadri MO, Amaechi V. Climate change and women's vulnerability in Nigeria: The view through Gender lens. *ASUU Journal of Social Sciences*. 2017;4(1&2):96-114.
- Dimitrov GBE. Effects of Climate change on Women. *International Journal of Multidisciplinary*. 2019;04(05):210-215.
- USAID (n.d). *Fact Sheet: Climate change and gender*. Washington D.C.: USAID.
- Jost C, Kyazze F, Naab J, Neelormi S, Kinyangi J, Zougmore R, Aggarwal P, Bhatta G, Chaudhury M, Tapio-Bistrom M, Nelson S, Kristjanson P. Understanding gender dimensions of agriculture and climate change in small holder farming communities. *Climate and Development*. 2016;8(2):133-144. DOI: 10.1080/17565529.2015.1050978.
- Huyers S. Gender and climate change in Macedonia: Applying a gender lens to the third national communication on climate change; 2012. Accessed June 25, 2021 from <http://www.unfccc.org>
- BNRCC. National adaptation strategy and plan of action on climate change for Nigeria (NASPA-CCN); 2011. Accessed October 10, 2019 Available:<http://csdevnet.org/wp-content/uploads/National-Adaptation-Strategy-And-Plan-Of-action.pdf>
- CIFRO (n.d). Gender and climate change: Evidence and experience. Bogor: CIFRO.
- GIWPS. Women and Climate Change: Impact and Agency in Human Rights,

- Security and Economic Development. Washington D.C: GIWPS; 2015.
17. Rao N, Elaine TL, Wapula NR, Divya S, Margaret NA. Gendered vulnerabilities to climate change: Insights from the semi-arid regions of Africa and Asia. *Climate and Development*. 2019;11(1):14-26.
 18. Nachmany M, Fankhauser S, Davidová J, Kingsmill N, Landesman T, Roppongi H, Schleifer P, Setzer J, Sharman A, Singleton CS, Sundaresan J, Townshend T. The 2015 Global Climate Legislation Study: A review of climate change legislation in 99 countries: summary for policy-makers. London: GLOBE International; 2015.
 19. Neumayer E, Thomas P. The gendered nature of natural disasters: The impact of catastrophic events on the gender gap in life expectancy, 1981-2002. *Annals of the Assoc of American Geographers*. 2007; 97(3):551-566.
 20. WHO. Our planet, our health, our future, human health and the Rio Conventions: Biological diversity, climate change and desertification. Geneva: WHO Press; 2012.
 21. WHO. The global burden of disease: 2004 update. Geneva: WHO; 2008.
 22. Kovats RS, Hajat S. Heat stress and public health: A critical review. *Annual Review of Public Health*. 2008;29:41–55.
 23. Aguilar L. Climate change and disaster mitigation. Gland, International Union for Conservation of Nature; 2004. Accessed January 15, 2020 Available:http://www.genderandenvironment.org/admin/admin_biblioteca/documentos/Climate.pdf
 24. Care Canada. Cyclone Nargis: Myanmar two years later. Ottawa: CARE Canada; 2010.
 25. Agwu J, Okhimamhe AA. Gender and climate change in Nigeria: A study of four communities in north-central and south-eastern Nigeria. Lagos: Heinrich Boll Stiftung (Hbs); 2009.
 26. WHO. Gender, climate change and health. Geneva: WHO; 2010.
 27. FAO. Gender and nutrition. Rome, FAO; 2001.
 28. Research foundation for science, Technology and Ecology. Women and water. New Delhi: Research Foundation for Science, Technology and Ecology; 2005.
 29. Ray I. Women, water, and development. *Annual Review of Environment and Resources*. 2007;32: 421-449.
 30. Agbonkhese O, Yisa GL, Daudu PI. Bad drainage and its effect on road pavement conditions in Nigeria. *Civil and Environmental Research*. 2013;3(10): 7-15.
 31. WHO/UNICEF. Global water supply and sanitation assessment 2000 report. Geneva and New York: WHO/ UNICEF; 2000.
 32. UNICEF. UNICEF handbook on water quality. New York: UNICEF; 2008.
 33. United Nations framework convention on climate change. Slow onset events: Technical. 2012;9-10. Accessed October 9, 2019 Available:<http://unfccc.int/resource/docs/2012/tp/07.pdf>.
 34. Ibekwe N. Floods: Sad tale from affected states- ERA/FoEN. *Premium Times*; 2012. Accessed July 5, 2020 Available:<https://www.premiumtimesng.com/news/103083-floods-sad-tale-from-affected-states-erafoen.html>
 35. UNHCR. UNHCR mid-year trends 2015. New York: UNHCR; 2015.
 36. Yonetani M. Global estimates 2015: People displaced by disasters. Geneva: Internal Displacement Monitoring Centre; 2015.
 37. Global Humanitarian Forum. The anatomy of a silent crisis: Human impact report climate change; 2009. Accessed July 5, 2021 Available:<http://www.ghf-ge.org/human-impact-report.pdf>.
 38. IDMC/NRC. Global report on internal displacement. Geneva, Switzerland: IDMC/ NRC; 2019.
 39. Azad AK, Hossain KM, Nasreen M. Flood-induced vulnerabilities and problems encountered by women in Northern Bangladesh. *Int. J. Disaster Risk Sci*. 2013;4(4):190–199.
 40. UN Women. The 2012 Fiji floods: Gender sensitivity in disaster management: A qualitative review of gender and protection issues in disaster response. Suva: UN Women; 2012.
 41. UN Women (n.d.). Climate change, disasters and gender-based violence in the Pacific. Suva: UN Women.
 42. UNDP. Baseline study on disaster recovery in Africa: Transitioning from relief to recovery. New York: UNDP; 2019.
 43. Ugwu FC, Ugwu CS, Ogba KTU. Institutional response and mechanism to the management of natural disaster in

Nigeria. In T. Chaiechi (ed.) Economic effects of natural disaster: Theoretical

foundations, methods and tools. London: Elsevier Inc. 2021; 381-396.

© 2022 *Scholastica and Olanrewaju*; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:

<https://www.sdiarticle5.com/review-history/84069>