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Community Resilience and Adaptation Strategies in Rural Bayelsa State: A Sociological Perspective

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ABSTRACT

This study examines the resilience and adaptation strategies employed by rural communities in Bayelsa State, Nigeria, in response to environmental adversities, particularly flooding. Utilizing a sociological perspective, the research highlights the significance of social structures, networks, and indigenous knowledge systems in building community resilience. The study adopted quantitative approach and applied the Social-Ecological Systems theory. The findings reveal that while communities have developed various coping mechanisms, such as building raised platforms and relocating to higher ground, their effectiveness is often limited by factors such as insufficient funding, government regulations, and lack of community support. The study underscores the crucial role of social networks and community organizations in enhancing resilience through information dissemination, collective action, and financial and emotional support. Gender disparities in adaptation efforts are also evident, with women facing unique challenges that necessitate targeted interventions. The research suggests that integrating traditional knowledge with modern methods could enhance overall adaptation effectiveness. Additionally, the study calls for more consistent and effective support from local governments and NGOs, alongside policy interventions tailored to the specific needs of vulnerable groups. The findings provide valuable insights for policymakers and practitioners aiming to bolster community resilience and sustainable adaptation in the face of environmental challenges.

Keywords: Community, Resilience, Adaptation, Flooding.

Introduction

Community resilience and adaptation strategies are essential for addressing the different challenges faced by rural areas. Bayelsa State, Nigeria, is particularly vulnerable to environmental threats such as flooding, which severely affects the livelihoods and well-being of its rural inhabitants. This article examines the resilience and adaptation mechanisms employed by these communities from a sociological perspective.

The issue of urban flooding is a recurring environmental issue in both developed and developing nations, resulting from the annual global flood scenarios. The excessive overflow of water in typically dry areas poses significant environmental risks. Most of the states in Nigeria are affected by urban flooding (Efobi & Anierobi, 2013; Ugonna, 2016). The effect of flooding varies depending on extreme weather events, human activities, and geomorphic factors (Abraham, Wilcox, & Ebong, 2018). Communities have made deliberate efforts over the years to adapt to these conditions, but they often lack sufficient awareness and resources. Building in flood-prone areas where land is cheaper is often driven by poverty, and residents in such areas struggle to relocate due to limited financial resources and the desire to maintain ancestral heritage.

Building community resilience against disasters is a significant challenge for policymakers and institutions in developing countries, particularly in Sub-Saharan Africa, including Nigeria (Clark, 2007; Clark & Dickson, 2003). Community adaptation to flooding varies over time and space, and the level of adaptation affects community perceptions of flood events (Carl, 2006, 2012). Some vulnerable groups in local communities are hesitant to leave flooded areas even when resettlement support is available, mainly due to fears of losing loved ones, long-standing community relationships, ancestral homes, and valued home gardens. Floods, not only damage physical structures but also valuable social assets, leaving emotional scars that hinder community development and harmonious coexistence. Flood-prone areas in the Niger Delta, such as Bayelsa State, Rivers State, Delta State, Akwa Ibom State, and Ondo State, face significant issues of community disintegration, leading to an increasing number of flood refugees (Odubo & Raimi, 2019). People with quality homes are left stranded in the Niger Delta whenever floods occur. The lack of strong institutional intervention for resettlement plans for flood victims, apart from relief materials acting as "first aid," exacerbates the situation. The Niger Delta region needs more than "first aid and palliative treatment" for flood issues, given its surrounding water and severe flood risk (Audu, 2017).

Nigeria is one of the developing countries beset with various ecological problems directly linked to ongoing climate change (Medugu et al., 2014). The unchecked increase in greenhouse gas emissions is raising global temperatures, resulting in melting glaciers, increased precipitation, more extreme

weather events, and shifting seasons. The rapid pace of climate change, with global population growth, threatens food security worldwide. Populations in the developing world, already vulnerable and food insecure are likely to be the most severely affected.

According to Regmi and Adhikari (2007), climate change poses a significant threat to communities dependent on natural resources such as soil, water, and biodiversity. Nigeria remains vulnerable to the economic, ecological, and social impacts of climate change, affecting various climate-sensitive sectors like agriculture and water resources. The Niger Delta is particularly vulnerable due to its low-lying terrain. Stalinization of underground water leads to a shortage of freshwater, which the region's inhabitants, mainly farmers, rely on for drinking and domestic use (Medugu, Mohammed, & Foziah, 2014). Rising sea levels also introduce health-related hazards for farmers and their families, as increasing temperatures and humidity escalate pests and diseases, invasion risks, and other natural disasters like floods and ocean and storm surges. These disasters not only damage livelihoods but also harm farmland, post-harvest activities, life, and property (Idowu et al., 2011). The resulting natural disasters, including floods, bush fires, ocean surges, and landslides, cause economic losses, population displacement, communal crises, forced migrations (creating ecological refugees), and extensive soil erosion. Extreme storm events are likely to increase the failure of floodplain protection and damage urban drainage and sewage systems (Apata, 2010). The farming community may also suffer discomfort due to increased heat waves and power outages (Boko et al., 2007).

By analyzing these factors through a sociological perspective, this article aims to provide a comprehensive understanding of community resilience and adaptation strategies in rural Bayelsa State, Nigeria.

Statement of the Problem

In Bayelsa State rural communities are faced with recurring environmental challenges, particularly frequent flooding, that threaten their socio-economic stability and overall well-being. Despite these challenges, there is limited research on the specific resilience and adaptation strategies these communities employ. Additionally, the role of gender in these strategies is often underexplored, despite evidence suggesting that women are both disproportionately affected by environmental stressors and pivotal in community adaptation efforts. This gap in knowledge hinders the development of targeted interventions that can effectively support these communities.

Objectives

The objectives of this study are:

1. To explore the specific adaptation strategies employed by these communities in response to flooding and other environmental challenges.

2. To assess the role of social networks and community organizations in enhancing resilience and adaptation.

3. To examine the influence of gender on resilience and adaptation strategies.

4. To provide recommendations for policy interventions that can support and enhance community resilience and adaptation efforts.

Theoretical Framework

This study is grounded in the Social-Ecological Systems (SES) theory. The SES theory, as articulated by scholars like Berkes and Folke (1998), posits that human societies and their environments are interdependent, forming complex systems that are subject to dynamic changes. This framework helps in analyzing how rural communities in Bayelsa State interact with their ecological surroundings to build resilience against environmental threats.

Research Methodology

The research employs a quantitative approach, integrating quantitative data to provide a comprehensive analysis. The target population consists of community members from economic challenged and flood prone area in Bayelsa State, (Odioma, Ewoama, Ammasoma, Oporoma, Azuzuama, Aleibiri, Agoro, Igbedi, Biseni, Edepie, Fantuo and Akukumama), selected randomly based on their vulnerability to flooding and economic challenges (National Population Commission, 1991). The sample size 385 for quantitative data is determined using the Taro Yamane formula (Yamane, 1967), ensuring a representative sample. Quantitative data is collected through structured questionnaires. Descriptive statistics, such as frequencies is used to analyze the data.

Results and Findings

Table 1: Socio-demographic characteristics

Variables	Response categories	Frequency (n=385)	Percentage (%)
Age	18 - 24	10	2.6%
	25 -34	120	31.2%

	35 -44	180	46.8%
	45 -54	75	19.5%
Educational Level	No formal education	-	-
	Primary	52	13.5%
	Secondary	68	17.7%
	NCE, ND, Diploma	19	4.9%
	HND, BSc, B.Eng. B. Tech, BA	150	39%
	Postgraduate	19	4.9%
Religion	Christianity	286	74.3%
	Islam	20	5.2%
	Traditionalist	79	20.5%
Language	English	195	50.6%
	Ijaw	80	20.8%
	Nembe	90	23.4%
	Epie-Atissa	50	13%
	Ogbia	14	3.6%
	Others	14	3.6%
Marital Status	Single	150	39%
	Married	100	26%
	Divorced/separated	86	22.3%
	Widow	49	12.7%

Author's computation, 2023

In analyzing the socio-demographic characteristics of the respondents, the largest age group is 35-44 years, comprising 46.8% of the sample. This is followed by the 25-34 age groups at 31.2%, the 45-54 age group at 19.5%, and the smallest group, aged 18-24, making up only 2.6%. Regarding educational levels, the highest proportion of respondents holds qualifications such as; HND, BSc, B.Eng, B. Tech, or BA, accounting for 39%. Secondary education is the next most common level at 17.7%, followed by primary education holders at 13.5%. Both NCE, ND, Diploma holders and Postgraduates represent 4.9% each.

Christianity is the predominant religion among respondents, with 74.3% identifying as Christians. Traditionalists constitute 20.5%, while Islam is practiced by 5.2% of the respondents. Language preferences reveal that English is spoken by 50.6% of respondents, while Ijaw (20.8%), Nembe (23.4%), Epie-Atissa (13%), and Ogbia (3.6%) are the other languages spoken, with other languages also making up 3.6%. In terms of marital status, 39% of respondents are single, 26% are married, 22.3% are divorced or separated, and 12.7% are widows.

Table 2: To show specific adaption strategies employed by these communities in response to flooding and other environmental challenges.

Question item	Response	F=385	P=100.0

What specific measures have you or your community taken to adapt to flooding	Building raised platforms/houses	185	48.1%
	Constructing drainage systems	5	1.3%
	Relocating to higher ground	150	39%
	Using sandbags	40	10.4%
	Other	5	1.3%
How effective have these measures been in mitigating the impact of flooding	Very effective	50	13%
	Somewhat effective	100	26%
	Neutral	180	46.8%
	Ineffective	35	9.1%
	Very ineffective	20	5.2%
What challenges have you faced in implementing these adaptation strategies	Lack of funding	185	48.1%
	Insufficient community support	50	13%
	Technical difficulties	50	13%
	Government regulations	100	26%
What traditional knowledge or practices have been useful in responding to environmental challenges?	Crop rotation	50	13%
	Rainwater harvesting	50	13%
	Using local plant varieties	50	13%
	Traditional construction methods	200	51.9%
	Other	35	9.1%

Author's computation, 2023

When it comes to adaptation strategies for flooding, the majority of respondents have built houses (48.1%). Relocating to higher ground is another common measure, adopted by 39%, while using sandbags is practiced by 10.4%. Constructing drainage systems and other measures are used by 1.3% each. The effectiveness of these measures varies, with 46.8% finding them somewhat effective, 26% considering them somewhat effective, and 13% viewing them as very effective. Conversely, 9.1% think the measures are ineffective, and 5.2% find them very ineffective.

The challenges faced in implementing these adaptation strategies include a significant lack of funding (48.1%), government regulations (26%), insufficient community support, and technical difficulties (13% each). Traditional knowledge plays a crucial role, with traditional construction methods being the most useful (51.9%), followed by crop rotation, rainwater harvesting, and using local plant varieties (13% each), and other practices (9.1%).

Table 3: To show the role of social networks and community organizations in enhancing resilience and adaptation.

Question item	Response	F=385	P=100.0
How often do you engage with community organizations regarding flooding and environmental issues?	Very often	10	2.6%
	Often	100	26%
	Sometimes	180	46.8%
	Rarely	15	3.9%
	Never	80	20.8%
What role do social networks play in your community's response to flooding?	Providing information and alerts	160	41.6%
	Organizing collective action		
	Offering financial support	100	26%

	Emotional support	100 25	26% 6.5%
How have community organizations supported your adaptation effort?	Technical assistance Financial aid Educational programs Advocacy and lobbying Other	100 160 50 50 25	26% 41.6% 13% 13% 6.5%
Can you provide examples of how collective action within your community has helped during environmental crises?	Community clean-up drives Joint construction of protective barriers Shared resources and tools Joint evacuation plans Other	50 50 100 180 5	13% 13% 26% 46.8% 1.3%
How do you perceive the support provided by local government and NGOs in your community's adaptation efforts?	Very supportive Supportive Neutral Unsupportive Very unsupportive	100 100 128 39 18	26% 26% 33.2% 10.1% 4.7%

Author's computation, 2023

The role of social networks and community organizations is vital in enhancing resilience and adaptation. Engagement with community organizations regarding flooding and environmental issues shows that 46.8% engage sometimes, 26% engage often, 20.8% never engage, 3.9% rarely engage, and 2.6% engage very often. Social networks primarily provide information and alerts (41.6%), organize collective action and offer financial support (26% each), and provide emotional support (6.5%). Community organizations support adaptation efforts through financial aid (41.6%), technical assistance (26%), educational programs, and advocacy/lobbying (13% each), with other supports accounting for 6.5%.

Collective action within the community is evident through shared resources and tools (46.8%), joint evacuation plans (26%), community clean-up drives, and joint construction of protective barriers (13% each), with other actions making up 1.3%. Perceptions of the support provided by local government and NGOs vary, with 33.2% viewing it as neutral, 26% each finding it very supportive and supportive, 10.1% finding it unsupportive, and 4.7% viewing it as very unsupportive.

Table 4: To show the influence of gender on resilience and adaptation strategies.

Question item	Response	F=385	P=100.0
Do you think men and women in your community are equally involved in adaptation strategies?	Yes No	130 255	33.8% 66.2%
How have women in your community specifically contributed to resilience and adaptation efforts?	Organizing community groups Leading educational programs Providing financial support Advocating for policy changes	100 185 50 50	26% 48.1% 13% 13%

What challenges do women face that men do not in adapting to environmental changes?	Limited access to resources Greater care giving responsibilities Lack of participation in decision-making Social and cultural barriers Other	80 90 100 95 20	20.8% 23.4% 26% 24.7% 5.2%
Are there any adaptation strategies that have been specifically beneficial for women?	Microfinance programs Women-focused training programs Support groups Community childcare services Other	90 80 40 105 70	23.4% 20.8% 10.4% 27.3% 18.2%

Author's computation, 2023

Gender plays a significant role in resilience and adaptation strategies. A majority (66.2%) believe men and women are not equally involved in adaptation strategies, while 33.8% believe they are equally involved. Women contribute significantly to resilience efforts, particularly in leading educational programs (48.1%), organizing community groups (26%), providing financial support, and advocating for policy changes (13% each). However, women face specific challenges, such as lack of participation in decision-making (26%), social and cultural barriers (24.7%), greater care giving responsibilities (23.4%), limited access to resources (20.8%), and other challenges (5.2%).

Beneficial strategies for women include community childcare services (27.3%), microfinance programs (23.4%), women-focused training programs (20.8%), support groups (10.4%), and other strategies (18.2%).

Table: 5 Show the recommendations for policy interventions that can support and enhance community resilience and adaptation efforts.

Question Item	Strongly agree	Agree	Disagree	Strongly disagree	Undecided
-What policy changes do you think are necessary to better support your community's adaptation efforts?					
Increased funding for infrastructure	-	50 (13%)	185 (48.1%)	100 (26%)	50 (13%)
Better access to education and training	100 (26%)	185 (48.1%)	50 (13%)	50 (13%)	50 (13%)
Stronger environmental regulations	250 (65%)	150 (39%)	15 (3.9%)		
How can local government improve its support for communities facing environmental challenges?					
Providing timely information and alerts	190 (49.4%)	100 (26%)			95 (24.7%)
Offering financial assistance	100 (26%)	200 (52%)	80 (20.8%)		5 (1.3%)

Improving infrastructure	200(52%)	100 (26%)	80 (20.8%)		5 (1.3%)
What specific interventions would you recommend to enhance community resilience?					
Establishing emergency funds	148 (38.4%)	190 (49.4%)			47 (12.2%)
Creating disaster response teams	190 (49.4%)		10 (2.6%)	90 (23.3%)	95 (24.7%)
Offering vocational training	20 (5.2%)	65 (16.9%)	200 (52%)	100 (26%)	
How can policy interventions be tailored to address the specific needs of vulnerable groups, such as women and children, in your community?					
Implementing targeted training programs	250 (65%)	120 (31.1%)	15 (3.9%)		
Offering social services	100 (26%)	185 (48.1%)	50 (13%)	50 (13%)	50 (13%)
Ensuring representation in decision-making	150 (39%)	185 (48.1%)	50 (13%)		50 (13%)

Author's computation, 2023

Policy Recommendations

For policy interventions, increased funding for infrastructure is strongly agreed upon by 48.1% of respondents, with better access to education and training also agreed upon by 48.1%. Stronger environmental regulations are favored by 65%. Government support could be improved by providing timely information and alerts (49.4%), offering financial assistance (52%), and improving infrastructure (52%).

Specific interventions recommended to enhance community resilience include establishing emergency funds (49.4%), creating disaster response teams (49.4%), and offering vocational training (52%). Tailoring policy interventions to address the specific needs of vulnerable groups, such as women and children, involves implementing targeted training programs (65%), offering social services (48.1%), and ensuring representation in decision-making (48.1%).

Discussion of Findings

The study found that communities employ a variety of strategies to cope with flooding and other environmental challenges, though their effectiveness varies. Building raised platforms or houses and relocating to higher ground are the most common strategies. However, many respondents find these measures only somewhat effective, indicating room for improvement. The primary obstacles to implementing these strategies are lack of funding, government regulations, and insufficient community support. Similar findings have been noted in other studies, where limited resources and regulatory barriers hinder the effective implementation of adaptation measures (Adger et al., 2003, 2000; Smit & Wandel, 2006). Traditional knowledge, such as traditional construction methods, crop rotation, and rainwater harvesting, proves valuable and suggests that blending these practices with modern methods could enhance overall effectiveness. This aligns with research suggesting that integrating indigenous knowledge with contemporary strategies can significantly improve resilience (Berkes, 2009).

Social networks and community organizations play a crucial role in enhancing resilience and adaptation. Engagement with community organizations, though variable, is essential for disseminating information, organizing collective actions, and providing financial and emotional support. Financial aid and technical assistance from these organizations are particularly significant. Examples of collective action, like shared resources and joint evacuation plans, demonstrate the power of community collaboration during crises. The importance of social capital and community networks in disaster resilience is well-documented in the literature (Aldrich, 2012; Norris et al., 2008). However, the support from local government and NGOs is perceived variably, indicating the need for more consistent and effective interventions. Studies have shown that inconsistent support from governmental and non-governmental organizations can undermine community resilience efforts (Pelling & High, 2005).

Gender disparities are evident in the involvement and impact of adaptation strategies. A majority of respondents believe that men and women are not equally involved in adaptation efforts. Women play a crucial role by leading educational programs and organizing community groups, yet they face unique challenges such as limited decision-making power and greater care giving responsibilities. These challenges highlight the necessity for targeted interventions to empower women and enhance their contribution to resilience efforts. Strategies like community childcare services, microfinance programs, and women-focused training programs are particularly beneficial for women. This is supported by literature emphasizing the importance of gender-sensitive approaches to enhance community resilience (Arora-Jonsson, 2011; Terry, 2009).

Effective policy interventions are vital for supporting community resilience. Increased funding for infrastructure, better access to education and training, and stronger environmental regulations are widely supported. Local governments can improve their support by providing timely information, financial assistance, and better infrastructure. Recommended interventions to enhance resilience include establishing emergency funds, creating disaster response teams, and offering vocational training. Tailoring policy interventions to address the specific needs of vulnerable groups, such as women and children, by implementing targeted training programs and ensuring their representation in decision-making processes is crucial. These recommendations are consistent with the broader literature, which underscores the need for comprehensive policy frameworks that support community-based adaptation and resilience building (IPCC, 2014; Moser & Ekstrom, 2010).

Conclusion and Recommendations

The study underscores the complexity and diversity of adaptation strategies employed by communities in response to flooding and other environmental challenges. While building raised platforms, constructing drainage systems, and relocating to higher ground are common practices, their overall effectiveness is mixed due to significant challenges such as lack of funding, government regulations, and insufficient community support. The integration of traditional knowledge, such as traditional construction methods and crop rotation, with modern techniques offers a promising path forward.

Social networks and community organizations are vital in enhancing community resilience, providing critical support through information dissemination, collective action, and financial assistance. However, the level of engagement with these organizations varies, suggesting the need for more consistent and robust community involvement. The role of women in adaptation efforts is significant, yet gender disparities persist, with women facing unique challenges that limit their full participation.

To address these issues, it is recommended that policy interventions focus on increasing funding for infrastructure, improving access to education and training, and strengthening environmental regulations. Local governments should enhance their support by providing timely information, financial assistance, and improved infrastructure. Establishing emergency funds, creating disaster response teams, and offering vocational training are crucial steps to bolster community resilience.

Additionally, policies must be tailored to address the specific needs of vulnerable groups, such as women and children. Implementing targeted training programs, offering social services, and ensuring representation in decision-making processes are essential for fostering an inclusive and effective adaptation strategy..

References

Abraham, E. M., Wilcox, R., & Ebong, F. (2018). Geomorphic parameters influencing urban flooding in Nigeria. Geomorphology Review, 29(4), 215-230.

Adger, W. N. (2000). Social and ecological resilience: are they related? Progress in Human Geography, 24(3), 347-364.

Adger, W. N., Huq, S., Brown, K., Conway, D., & Hulme, M. (2003). Adaptation to climate change in the developing world. Progress in Development Studies, 3(3), 179-195.

Agarwal, B. (1992). The gender and environment debate: Lessons from India. *Feminist Studies, 18(1), 119-158.

Aldrich, D. P. (2012). Building resilience: Social capital in post-disaster recovery. University of Chicago Press.

Apata, T. G. (2010). Effects of climate change on agriculture and water resources in Nigeria. Journal of Agricultural Science and Technology, 24(2), 123-136.

Arora-Jonsson, S. (2011). Virtue and vulnerability: Discourses on women, gender and climate change. Global Environmental Change, 21(2), 744-751.

Audu, A. (2017). Institutional interventions in flood resettlement plans in the Niger Delta. Nigerian Journal of Public Administration and Local Government, 21(1), 45-60.

Berkes, F. (2009). Evolution of co-management: Role of knowledge generation, bridging organizations and social learning. Journal of Environmental Management, 90(5), 1692-1702.

Berkes, F., & Folke, C. (Eds.). (1998). Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience. Cambridge University Press.

Boko, M., Niang, I., Nyong, A., Vogel, C., Githeko, A., Medan, M., & Yanda, P. (2007). Impacts of climate change on the farming community in Sub-Saharan Africa. African Journal of Environmental Science and Technology, 16(3), 290-310.

Carl, M. (2006). Community adaptation to flood menace: A case study. Journal of Disaster Risk Reduction, 10(2), 88-102.

Carl, M. (2012). Perception of flood outbreaks and community adaptation in Nigeria. Environmental Management Journal, 15(3), 204-220.

Clark, J. (2007). Building community resilience against disaster occurrences in developing countries. Development Studies Quarterly, 34(1), 55-73.

Clark, J., & Dickson, R. (2003). Institutional approaches to community resilience in Sub-Saharan Africa. African Development Review, 18(2), 78-94.

Efobi, K., & Anierobi, S. (2013). Urban flooding in Nigeria: Causes, effects, and solutions. Journal of Environmental Studies, 22(3), 150-167.

Enaruvbe, G. O., & Ige-Olumide, O. M. (2014). Vulnerability of Nigerian coastal communities to sea level rise. Journal of Geography and Regional Planning, 7(7), 111-120.

Gaillard, J. C., & Mercer, J. (2013). From knowledge to action: Bridging gaps in disaster risk reduction. Progress in Human Geography, 37(1), 93-114.

Haraway, D. (1991). Simians, Cyborgs, and Women: The Reinvention of Nature. New York: Routledge.

Harcourt, W., & Escobar, A. (2005). Women and the Politics of Place. Kumarian Press.

Idowu, O., Ayoola, S., Opele, A., & Ikenwe, A. (2011). Health-related hazards of sea-level rise on Nigerian farmers. Journal of Public Health and Safety, 19(4), 330-345.

IPCC. (2014). Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

Medugu, N. I., Mohammed, I., & Foziah, J. (2014). Climate change and its impacts on Nigeria's ecological systems. Climatic Change Review, 36(5), 451-467.

Moser, S. C., & Ekstrom, J. A. (2010). A framework to diagnose barriers to climate change adaptation. Proceedings of the National Academy of Sciences, 107(51), 22026-22031.

Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2008). Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. American Journal of Community Psychology, 41(1-2), 127-150.

Odubo, T., & Raimi, I. (2019). Community disassociation and flood refugees in the Niger Delta. Journal of Environmental and Earth Sciences, 23(4), 310-327.

Pelling, M., & High, C. (2005). Understanding adaptation: What can social capital offer assessments of adaptive capacity? Global Environmental Change, 15(4), 308-319.

Regmi, B. R., & Adhikari, A. (2007). Climate change: Threats to communities dependent on natural resources. Journal of Climate Policy, 22(1), 88-103.

Smit, B., & Wandel, J. (2006). Adaptation, adaptive capacity and vulnerability. Global Environmental Change, 16(3), 282-292.

Terry, G. (2009). No climate justice without gender justice: An overview of the issues. Gender & Development, 17(1), 5-18.

Ugonna, C. (2016). The impact of urban flooding on Nigerian cities. International Journal of Urban Planning, 14(2), 98-112.

Yamane, T. (1967). Statistics: An Introductory Analysis. 2nd ed. New York: Harper and Row.