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ENVIRONMENTAL-INDUCED MIGRATION AND LIVELIHOOD VULNERABILITY IN PATIGI LGA, KWARA-NORTH SENATORIAL DISTRICT, NIGERIA

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ABSTRACT

Migration and livelihood are interwoven so that both can be perceived as products of the environment. This paper provides an in-depth analysis of the global occurrence of forced migration as a result of environmental stress, which is a global challenge. However, approaches adopted in confronting it vary globally, and the present study contributes to global knowledge from a rare perspective. The approach solution to environmental stress holistically, particularly with the advocacy for community members' participation at every stage of solution building, which was downplayed in the past in solving disaster-prone area challenges. It neglects the adoption of edge-cutting methods, such as the blue economy approach, that the old order did not have. The paper assessed the prevalence and occurrence of environmentally induced disasters in Patigi's environs as well as their impact on livelihood vulnerability as a case study. The data for this study were obtained from a structured questionnaire, focus group discussions (FGD), and in-depth interviews. Purposive sampling was used by the National Emergency Management Agency to select five communities considered disaster-prone areas. These communities are Edochigi, Gudugi, Mawogi, Sokingi, and Gakpan. A total of 125 copies of structured questionnaires were administered using a disproportionate random sampling technique. Twenty-five disaster victims were selected from each community. The result showed that floods accounted for 72% of the prevalence of environmental disasters in the study area. Findings also revealed that 75.2% of the respondents are mostly farmers in rice cultivation. The correlation analysis shows that flooding greatly impacts farming, with a correlation of 0.615, especially during the rainy season. The study concluded that environment-related disasters had led to displacement and negatively impacted inhabitant livelihoods. The study recommended the need for community members' involvement in the problem-solving process and the need to adopt the blue economy concept to minimize the adverse effects of disasters.

Keywords: *environmental disaster, livelihood, vulnerability, migration, blue economy*

INTRODUCTION

The scourge of environmentally induced migration permeates international space, particularly in the developing world. Many developing nations experience frequent migration due to

environmental stress, which manifests in different forms. This depends on the prevailing predisposition factors in each area. In Africa, for example, where there is a high occurrence of floods, many families migrate seasonally to avoid the effects of floods that usually occur during rainy seasons. Most areas in the Equatorial Guinea climatic belt where there is intense rainfall are always victims of floods whenever there is such an occurrence. Also, the poverty-stricken population that lives close to big rivers and oceans in shanties and slums most often moves away from their vulnerable locations. This is observed or seen in areas in South America, with particular reference to Brazil.

In December 2021, countries such as Malaysia and Spain witnessed heavy rains resulting in floods, while wildfires occurred in Australia and Argentina. Also, volcanic eruptions were experienced on Mt. Semeru in Indonesia, on the Spanish island of La Palma, and in a deadly typhoon in the Philippines (Bir, 2022). Also, ninety per cent of several documented disasters globally are traceable to environmental concerns (Yande, 2009). It was observed that the most common problem in recent times is the issue of involuntary displacement globally as a result of environmentally induced disasters causing victims to migrate from their usual place of residence (WorldDisaster, 2016). On average, close to 27 million people are displaced each year. This trend dates back to 2008, which translates to 72,131 people per day (World Disasters Report, 2016), as cited in Awotayo, 2019. A more significant percentage of disaster-vulnerable people reside in third-world countries with a low human development index; thus, Nigeria is not left out (Galaz and Moberg, 2008, cited in Olawepo and Awotayo, 2020). Therefore, African nations are not exempt from floods and other environment-induced disasters that cause migration. The issue of environmentally induced migration is of great concern in Nigeria. This is because the nation has suffered from multiple natural and man-made hazards in recent times, and this has had a significant impact on the socio-economic pattern of individual life. Today, the various dimensions of environmental disasters have become a common occurrence and have led to the loss of lives as well as the displacement of millions of people in the country.

In Nigeria, most riverine areas are very susceptible to flooding, especially at high tide and during the rainy season, because such areas are situated in a lowland environment (Adelakan, 2009). The study area for this paper, which is Patigi Local Government Area, is geographically located around the River Niger axis, and most of the communities in the LGA are found on the bank of the River Niger, which makes them vulnerable to the slightest rise in sea level. Thus, there are documented records of seasonal floods and erosion in communities such as Gakpan, Kpada, Gbaradogi, Ella, Gbafu, Sankuso, Ella, Edozhigi, Ezhigiko, Manba, Magi, Jifu, Zanchita, Ebwaa, Eesungi, and Mawogi, among others, which are agrarian communities. Therefore, this reoccurring incidence is a threat and challenge to the livelihoods of these agrarian communities with limited capacity to adapt to climate variability and change.

The aftermath of this environmental degradation includes but is not limited to a threat to food security, poverty, and family displacement. Further depreciating effects of this environmental disaster are also influenced by the time of occurrence, level of preparedness, risk assessment techniques, and other factors that could serve as impediments to a proper and holistic approach to studying the spatial pattern of disasters in a particular geographical location. Environmental disasters causing forced migration are a significant impediment to the survival and livelihood

strategies in the study area. Once livelihood is affected, there will be a great impact on people's income and their ability to survive maximally.

Thus, the issue of environmentally induced migration in Patigi LGA, Kwara-North Senatorial District, represents an area predisposed to environmentally induced disaster as a direct consequence of flood, erosion, and land degradation, among others. Given this, the study assessed the prevalence and occurrence of environmentally induced disasters in Patigi's environs as well as their impact on livelihood vulnerability in the study area. Livelihood is earning income to sustain life (Chambers and Conway, 1991). In the same vein, the IPCC (2014) opined that livelihood is conceived as virtue and values knitted together in the form of a set of capabilities, assets, and activities. Livelihoods are further agreed upon to include all processes that ensure the meeting of basic needs (Brundtland, 1987). The uncertainty of survival in rural Africa makes livelihood a threat (Raheem, Olorunfemi, Fashae, and Awotayo, 2013). The rural poor in developing countries remain the most directly dependent on natural resources for their food and livelihood security (FAO, 2007). Livelihood is shown to be directly attached to fragile land for natural resources in Africa (World Bank, 2005).

Also, the interplay of socio-economic fabrics can determine the quality of livelihood. Livelihood can thus be seen from the perspective of meeting needs, be they material, food, psychological, or health-related. Therefore, a livelihood can be summarised as meeting the various needs of a man without damaging or affecting his socio-economic status. On the other hand, vulnerability is a signal of danger ahead.

Innovative Emergence: The Blue Economy Concept

The challenge of environmental stress has remained protracted. This usually leads to forced migration, and most times, the livelihood, lives, and property of migrants are seriously affected. However, several efforts and approaches that have been adopted defy major success, which has necessitated more direct and productive means. One that has shown great prospects is the blue economy, which incorporates many means of adaptation. The blue economy is a means of achieving sustainable use of ocean resources for economic growth and improved livelihoods without jeopardizing the health and resiliency of the ocean ecosystem (European Commission, 2020). It focuses on the sustainable economic development of ocean resources by addressing the negative impact of climate change and environmental problems as observed by the World Bank (2022) and Independent Evaluation Group (2023).

Jakarta Post (2020) believes that although the concept might be sustainable, there is a challenge in its implementation as it runs the risk of displacing local communities and livelihoods, especially in Indonesia. Also, the blue economy is highly technologically driven and provides a reliable alternative to environmental problems. It is a major novelty in the realm of man-environment interaction. This is significant because it has proved workable in a few areas that have been adopted. The concept focuses on environmental resilience rather than succumbing to environmental challenges. And that is why the European Economic and Social Committee (2021) advocates for the need for more education to create more awareness of the significance of the blue economy and achieve its aim. It is worthy of note that no matter the critics of this concept, the blue economy is far safer and better and can be used to achieve Sustainable Development Goal 14, "Life below water."

Community Member's Solution Approach

Environmental disasters rarely occur without some cumulative factors before any triggering factor. Most of the time, when the environment is strained and stressed, some indicators serve as a precursor for disaster that settlers or community members usually ignore. These factors are ignored deliberately or as a result of limited options. However, when solutions to environmental problems arise, many community members' views are rarely heard. These most often create a big gap between the reality that victims experience and the knee-jerk solution. This method has proven to be grossly deficient and not sustainable, hence the need to look inward and always involve the community members who are the victims in the solution process firsthand.

This method has proven to be grossly deficient and not sustainable, hence the need to look inward and involve the occupiers, the victims, in the solution process firsthand. Thus, the community participatory approach directly engages local priorities and perspectives in solving societal problems (Cornwall and Jewkes, 1995). Also, Olawepo (2006) buttressed the need for this approach in the Jebba resettlement scheme to achieve community-based development. Frances (1999) observed that despite the greater efficiency and effectiveness claimed to be achieved by the community member participation approach in ensuring the sustainability of development, this approach needs to be subject to greater critical analysis. He is of the view that, though participation is intrinsically a `good thing', especially for the participants, the issue of efficiency should be placed with the equity and empowerment arguments and be carefully examined. In addition, Mayoux (1995) is of the view that the cost and benefits of participation for individuals fall differentially and are mediated and perceived by people in different ways.

However, Green (2010) observed that the community members' participation approach enables diverse stakeholders to temporarily align themselves around a common project for development implementation, which is a people-centred orientation. This will ensure that pinpoint solutions to problems start with the identification of predisposing factors up until the disaster period. This will strengthen the preparedness to mitigate the level of occurrence as well as proffer adaptive measures that will suit the peculiarities and magnitude of the disaster. Aside from the fact that occupiers will have confidence in understanding their environmental problems, they will equally be emboldened to find a sustainable solution to their problem.

CONCEPTUAL ISSUES AND THE THEORETICAL FRAMEWORK

Environmental migrants are persons or groups of persons who, for compelling reasons of sudden or progressive change in the environment that adversely affects their lives or living conditions, are obliged to leave their habitual homes mono or choose to do so, either temporarily or permanently, and who move either within their country or abroad (IOM) Thus, environmentally induced migration encompasses all forms of human mobility caused by environmental factors. This migration type is rarely mono-causal, and cause-consequence relations are increasingly complex and multi-factorial. These environmental factors interact with many other factors to influence migration decisions. The reason is that environmental signals are more robust than those perceived by migrants themselves. In most cases, environmental change affects migration through livelihoods. Livelihoods deteriorate due to changing climatic conditions and land

degradation over time. The more direct the link between environmental quality and livelihoods, the stronger the role of the environmental push factor in migration choices (Figure 1).

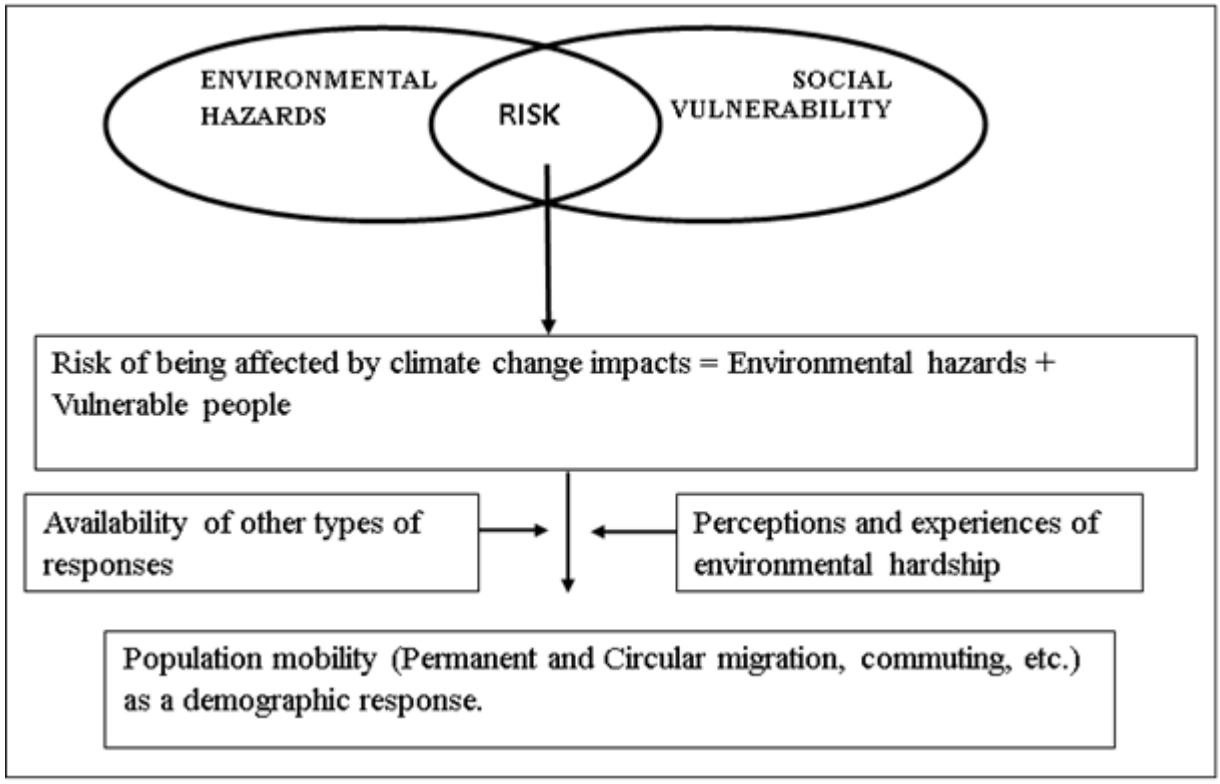

Figure 1: Natural Hazard, Vulnerability, and Risk
Source: Keipi and Tyson, 2002

Theories of Environmentally Induced Migration

Afifi and Warner (2008) are the first researchers to include environmental variables in addition to different economic, political, social, historical, and cultural indicators in a gravity model and relate all these factors to migration. They found out that the environment has a significant positive impact on migration flows across countries. Conventionally, migration flows have been described under push and pull factors, expressing the existence of the origin of a centrifugal force that repels people from the origin to destinations, which also contain variables that are centripetal in nature and attract people to them. Climate change might provide both "push" and "pull" for some population displacement.

The push-pull factors approach to migration helps clarify the factors that intervene in the decision to migrate in response to environmental stressors (Lee, 1966): push factors (from origin regions) include natural disasters, gradual climate-driven environmental changes, ethnoreligious clashes, land disputes, changing landscapes, and armed conflicts over shrinking natural resources, while pulling factors (from destination regions) include better economic opportunities and better ecosystems and networks in the destination regions. It is obvious that the pull factors are very often economic (e.g., higher income and a better standard of living) rather than

environmental. Conventionally, push-pull theories have tended to dominate the debate on the environmental change-migration nexus.

The push factor sees environmental change as one factor determining migration; therefore, establish a correlation between environmental change and migration as applied to the range of demographic responses to environmental change, of which migration is an option. At the same time, multi-level contextual drivers consider a more complex, dynamic relationship between environmental change and migration in the sense that they account for the complex interplay of structural and agency factors in migration dynamics with various responses to environmental change, including resilience, adaptation, and survival strategies of the people affected.

STUDY AREA AND METHODOLOGY

The sample for this study is disaster victims in Patigi LGA. Patigi LGA is located between latitudes 8º 30º N and 8º 57º N and longitudes 5º 30o E and 6º 11o E, with a population of 110852 (NPC, 2009) and 2,988 km2 in terms of area covered. Patigi is one of the LGAs created in 1996, with its headquarters in Patigi town. Settlements in the LGA include Edochigi, Gudugi, Mawogi, Sokingi, Gakpan, Kpada, Lade, and Oroogu, among others (Figures 2a and b). The inhabitants' primary occupation is agricultural activities such as rice, yam, and maize cultivation, owing to their location on the bank of the Niger. Thus, the larger part of Patigi falls within the bank of the River Niger. This usually makes the inhabitants prone to perennial flooding and other water-prone environmental challenges.

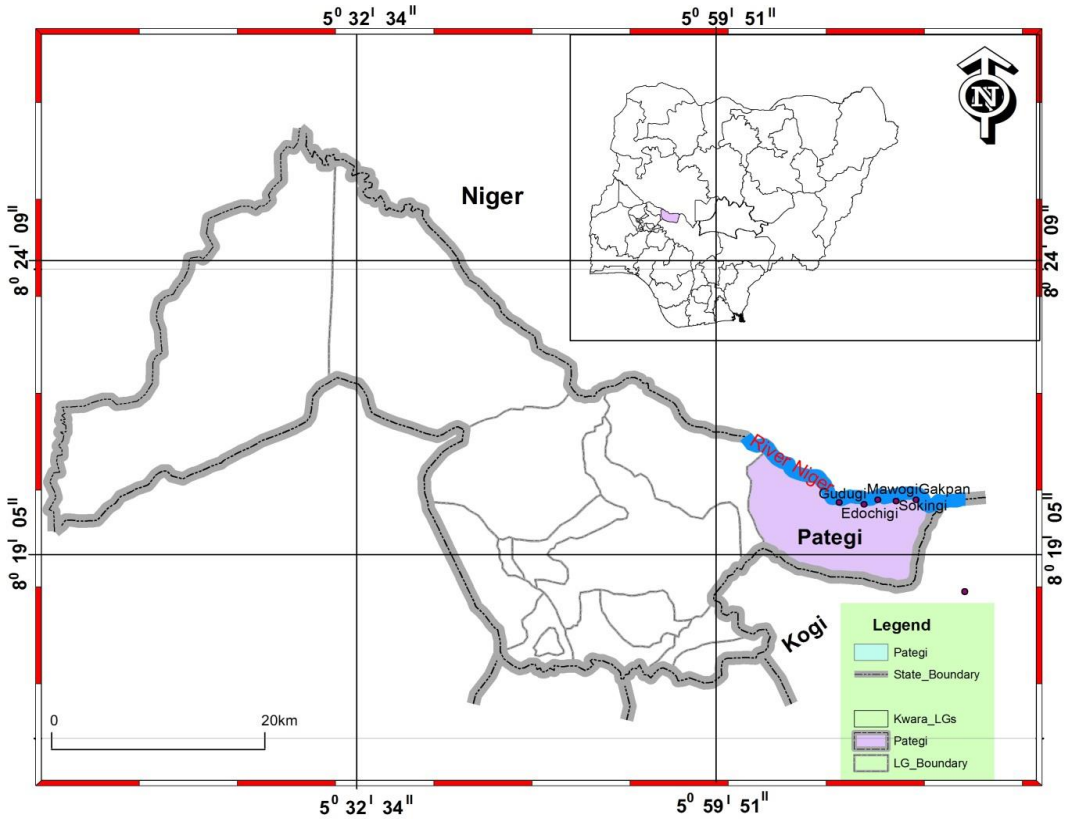

Figure 2a: Map of Kwara State, Showing Patigi LGA

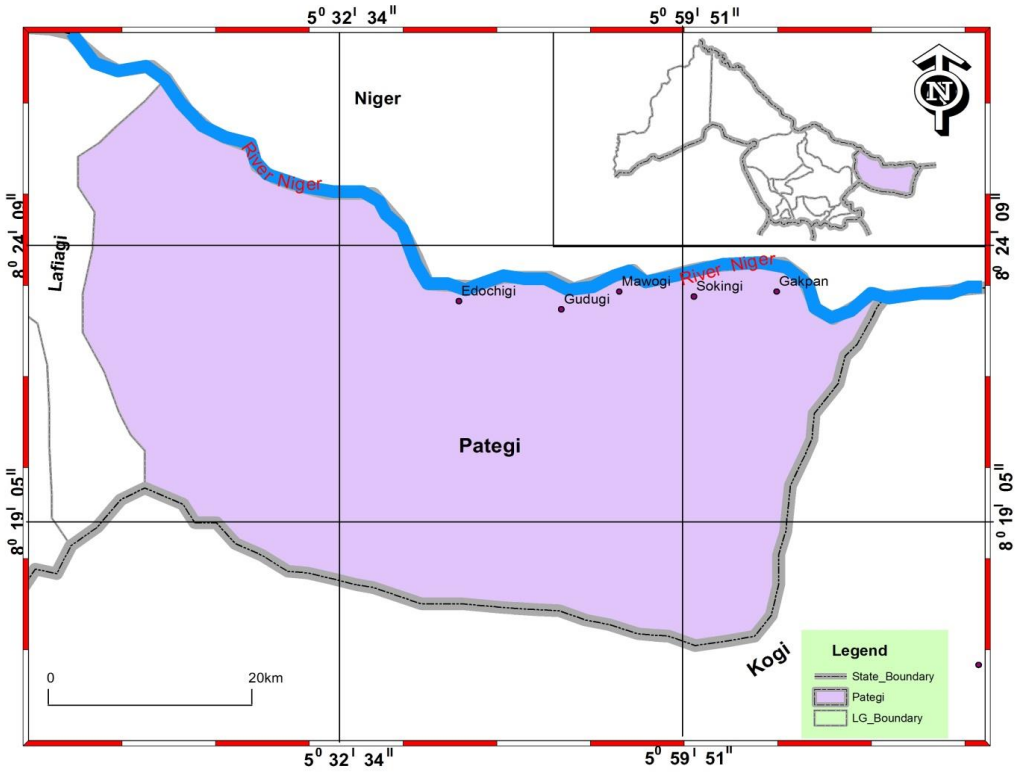

Figure 2b: Map of Patigi LGA

The study adopts a multi-stage sampling technique. In the first stage, purposeful sampling was used to select five (5) communities in the study area with the highest frequency of disaster occurrences in the last eight years. These communities are Edochigi, Gudugi, Mawogi, Sokingi, and Gakpan. In the second stage, a convenient sampling technique was used to select twenty-five people in each of the five communities who had experienced environmental-related disasters in the last eight years (2012–2020). A total of one hundred and twenty-five (125) copies of the questionnaire were administered to disaster victims in the study area, and this formed the sample size. In addition, the third stage employed the use of focus group discussions (FGD) and in-depth interviews (IDI) conducted in each of the five communities selected in the study area. A total of five FGDs and five IDIs were conducted in the study area and analyzed using content analysis. Other data collected were analyzed using descriptive statistics as well as T-test analysis.

RESULTS AND DISCUSSION

The result of the respondents' age in Table 1 across the 5 communities of Edochigi, Gudugi, Mawogi, Sokingi, and Gakpan shows that 24.8% fall within the age range (31–40), 39.2% (41–50), 24.8 (51–60), and 11.2% (61 and above). This implies that 89% of the respondents across five communities fall within the labour force. This suggests that most disaster victims fell within a very active and productive age range. The occurrence of environmental hazards in the study area, as revealed in Table 1, shows flooding (72%), erosion (16%), bush burning (6.4%), and others (5.6%). Thus, the occurrence of environmental disasters in Patigi LGA can be described as a mono-disaster occurrence, which is the major flood.

Thus, the trend of the flood pattern is evident due to the fact that Patigi is well located in the Niger-Benue Trough, which is almost at the same level as the River Niger. The peculiarity of the affected communities is that they are mostly riverbanks, which makes them more vulnerable to flooding than any other form of environmental disaster. Thus, flooding is the biggest challenge to the livelihood and survival of the inhabitants of Patigi and its environs. Further analysis from Table 1 shows that the livelihood of the respondents in the study areas of Edochigi, Gudugi, Mawogi, Sokingi, and Gakpan ranges from farming (75.2%), trading (9.6%), artisan (9.6%), and civil servant (1.6%). The analysis implies that farming is the mainstay of the economy in the study area. The reason is that the study area's communities are located in the flood plain, thus encouraging agricultural activities such as rice cultivation and maize planting, among others. This clarifies why farming is the predominant occupation among the respondents, with even non-major farmers partaking in agricultural activities to some extent. It can also be deduced that communities heavily reliant on agriculture for their livelihood are at greater risk and vulnerability when environmental catastrophes, like floods, take place. Therefore, environment-related disasters may–have reduced their productivity and also affected their livelihood since those affected may be forced to move or migrate to other areas in search of greener pastures.

The result from the Focus Group Discussion (FGD) reveals that the spatial pattern of internally displaced persons during this flood incidence shows that the victims do not usually have a specific location, especially if the flood is temporal. However, if it lasts for weeks, they typically move to Patigi, an upper plane where it is generally marked safe. Disaster victims are usually not compensated proportionately for their vulnerability.

Table 1: Socio-economic activities around Edochigi, Mwogi, Gudugi, Sokingi, and Gakpan of Patigi L.G.A.

Status	**Edochigi**		**Gudugi**		**Mawogi**		**Sokingi**		**Gakpan**		**Total**	
Age	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**
Less than 18	0	0	0	0	0	0	0	0	0	0	0	0
18-30	0	0	0	0	0	0	0	0	0	0	0	0
31-40	4	3.2	5	4.0	9	7.2	7	5.6	6	4.8	31	24.8
41-50	11	8.8	17	13.6	5	4.0	8	6.4	8	6.4	49	39.2
51-60	10	8.0	0	0	8	6.4	7	5.6	6	4.8	31	24.8
61 above	0	0	3	2.4	3	2.4	3	2.4	5	4.0	14	11.2
Total	25	20	25	20	25	20	25	20	25	20	125	100
Occupation	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**
Farming	18	14.4	16	12.8	23	18.4	17	13.6	20	16.0	94	75.2
Trading	2	1.6	4	3.2	0	0	4	3.2	2	1.6	12	9.6
Artisan	2	1.6	3	2.4	2	1.6	2	1.6	3	2.4	12	9.6
Civil Servant	1	0.8	1	0.8	0	0	0	0	0	0	2	1.6
Fishing	0	0	1	0.8	0	0	2	1.6	0	0	3	2.4
Others	2	1.6	0	0	0	0	0	0	0	0	2	1.6
Total	25	20	25	20	25	20	25	20	25	20	125	100
Env. Hazard	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**
Flood	19	15.2	17	13.6	15	12	19	15.2	20	16	90	72
Erosion	3	2.4	5	4.0	6	4.6	3	2.4	3	2.4	20	16
Bush Burning	2	1.6	2	1.6	1	0.8	2	1.6	1	0.8	8	6.4
Others	1	0.8	1	0.8	3	2.4	1	0.8	1	0.8	7	5.6
Total	25	20	25	20	25	20	25	20	25	20	125	100

Source: Author's Fieldwork, 2022

Table 2 shows the relationship between floods and livelihoods. Examining the correlation between floods and different professions, floods have a substantial impact (0.615) on agricultural activities. This implies that as the magnitude of floods continues to rise, the extent of havoc on farmlands will also rise correspondingly. This means that in the event of a flood, most of the arable lands would be covered with water overflowing the bank of the River Niger. Most of the time, the occurrence of floods has devastating effects on the livelihoods of the inhabitants since their income is generally tied to agriculture. Sometimes many farmers have to wait for the waters to subside, while in other cases, it results in loss of farmland, displacement, and loss of farm crops and produce, among others. When the magnitude of the flood is very high, it may render some community dwellers homeless (Figure 3). This has great implications for the livelihood of the inhabitants and their survival. When there are no farm products to sell, traders will look for an alternative.

Table 2: T-Test Values Between Flood and Livelihood (Occupation)

Variables (Flood and Occupation)	T- Test
Farming	0.615
Trading	0.0009
Artisan	0.0005
Civil Servant	0.0006
Fishing	0.0001
Others	0.0002

Source: Author's computation (2022).

Figure 3: Effect of Flooding in Gudugi
Source: Author's Fieldwork, 2022

From the above analysis, it can be deduced that environmental-related disasters such as floods and flash floods posed a major threat to people's survival in Patigi and its environs. This has posed different environmental challenges, such as nutrient loss from the soil, loss of livelihoods, loss of income, spread of infectious diseases, and destruction of valuables.

Coping Mechanism

It is indeed necessary for man to find a way of adjusting or adapting to various circumstances occurring and reoccurring in his environment. The people of Patigi Local Government Area have resorted to different forms of coping mechanisms. Most of the coping strategies used by disaster victims are intra-provisional. The coping mechanisms presented in Figure 4 show that the respondents depend on non-governmental organizations (NGOs) (9.6%), the National Emergency Management Agency (NEMA) (11.2%), religious organizations (8%), friends and relatives (67.25%), international organizations (0.8%), and others (3.2%). This implies that the majority of disaster victims depend on friends and relatives for survival during environmental disasters. This implies that most of the coping strategies used by the disaster victims are intra-provisional, as the majority look up to friends and relatives during the occurrence. The FGD also reveals that the only thing the government usually provides for farmers is relief, such as cloth and food, but no seedlings or any form of compensation. This makes them lose a lot and be indebted. This mostly occurs during the rainy season and is complicated by the release of water from the River Yawuri in Kebbi State, Kainji, or Tiga dam. Thus, making the people homeless.

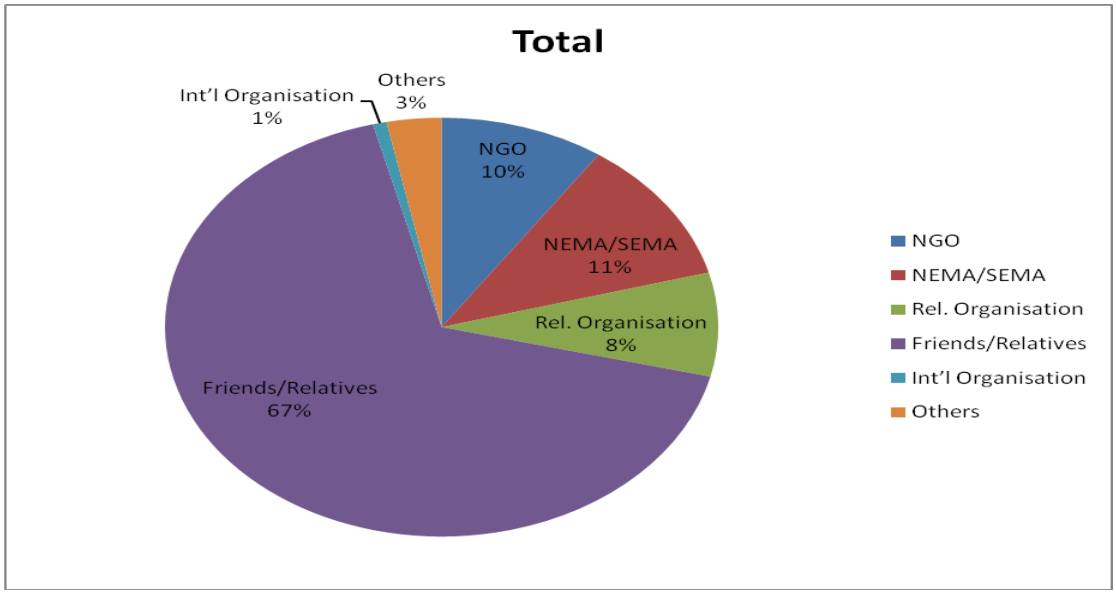

Figure 4: Percentages of a coping mechanism comprising Edochigi, Mawogi, Gudugi, Sokingi, and Gakpan of Pategi Local Government Area

Source: Author's Fieldwork (2022).

CONCLUSION AND RECOMMENDATION

Patigi and its environs, according to findings, are an agrarian community and the local government at large. Patigi and its environs, according to findings, are an agrarian community, and flood occurrence is the most prevalent among the observed environmental hazards in the area. This is usually experienced at the peak of the rainy season and during the release of water from the dam through the spillway. Also, the elevation of Patigi is very low; thus, it is very easy for the river to rise above its banks and adjoining land areas.

Thus, flooding is a major impediment to the survival and livelihood strategies in the study area. Since most of the farmland is not far from the riverbank, this makes the farms vulnerable. Therefore, once the livelihood is affected, there will be a great impact on the income of the people and their ability to survive maximally. This is because it comes with challenges such as loss of agricultural land, unmanageable and large-scale forced migration, and a crisis in the health status of victims.

The environmental crisis in the Patigi LGA due to flooding can be controlled using a blue-line sustainable economy. We might not be able to prevent the occurrence of environmental-induced happenings and their resultant effects on migration and livelihood vulnerability in Patigi, but we can mitigate the impact of their effects, especially on the people living along the riparian route, using the concept of blue line economy. For instance, most of the flooded areas can be converted into vegetation zones or classified as buffer zones for hydrophyte farming. The humus-rich silt soil from the siltation via the runoff water can be used for planting leguminous crops. Similarly, blue-line economies can also be used to educate the population of people along the riverine zones in the study area on the sustainable utilization of river economies. Its purification and prevention from pollution, especially through the use of some unfriendly techniques that could be beneficial to the life forms in the river, Thus, there is a need for the government at all levels to looked inward and always involve the community members who are the victims in the solution process when solving environmental issues. This is because community members will have more confidence in understanding their environmental problems than any other person and should be included in the problem-solving process. In addition, the blue economy concept can be incorporated as a means of adaptation by creating enough awareness of the need for the inhabitants to live far away from the seabank. Also, educating the people on how river resources can be well utilized sustainably, even by using indigenous knowledge,

In this sense, one of the ways to minimize the adverse effect of flooding on the livelihood of the people every year in Patigi is to practise upland farming or dry rice farming and for the government to come to the aid of the people in the provision of irrigation farming. This can be replicated anywhere in the world that experiences such an occurrence.

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