ASSESSING THE POSITIVE IMPACTS OF COP DECISIONS ON FLOOD-AFFECTED COMMUNITIES IN KATSINA STATE, NIGERIA

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Keywords

COP, Climate change, Climate adaptation, Carbon neutrality, Flooding

Abstract

Research Problem: *This study becomes important because climate change represents one of the most significant challenges facing the global landscape in the 21st century, especially flooding is the principal environmental concerns facing Katsina State, at which pose a significant threat to fundamental infrastructures that have caused property damage, loss of cultural heritage, fatalities, injuries and displacement in the state.*
Method/Theory: *the study is anchored on Environmental Justice Theory as well as utilizing both qualitative and quantitative research approaches which include structured questionnaire, key informant interview and relevant documents during the research. Krejcie and Morgan's table used to sample 297 individuals at flood-affected communities.*
Results*: the findings indicate that international climate commitments have positively influenced climate adaptation and disaster risk reduction initiatives at the national and subnational levels. These efforts have contributed to improved long-term climate finance, preventing hunger and ensuring food security, boosting low emission, and support for flood-affected communities through resilience-building programmes.*
Conclusion*: the study concludes that sustained implementation of COP-related decisions, stronger collaboration among government agencies, development partners and local communities as well as increased investment in climate adaptation are essential for achieving long-term*

resilience and sustainability in flood-affected communities.
***Key contribution to knowledge**: the study advances existing literature by providing empirical evidence on how global COP decisions translate into tangible benefits for flood-affected communities at the subnational level in Katsina state.*
***Recommendation**: this study finally recommends that subnational authorities should translate relevant COP decisions into state-level climate adaptation policies and ensure they are effectively implemented in flood-prone communities.*

Introduction

The 1992 United Nations Earth Summit in Rio established the United Nations Framework Convention on Climate Change (UNFCCC) which created a legal framework for international collaboration to address climate related risks, with the Conference of the Parties (COP) serving asthe supreme decision-making body of the convention. Every country that has ratified the convention is represented at the COP since 1995, where they examine how the convention is being implemented as well as any other laws that COP passes and make the decisions required to support the convention's successful implementation.COP also review the reports submitted by Parties on GHG emissions and climate actions. A key target of COP is to regulate greenhouse gases effects in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system (Burnett, 2023). It ensures that climate actions are in order for ecosystems to organically adjust to climate change, such a level need to be reached in a timely manner.

Nigeria filed its final updated Nationally Determined Contributions (NDCs) in 2021 after the Paris Agreement was ratified in March 2017,which she promises to reduce emissions by 20% below business-as-usual by 2030 without conditions and by 47% with foreign funding, technological transfer, and capacity building (FGN, 2021). However, Nigeria has signed the National Climate Change Policy (NCCP), and authorised the Nigeria Climate Change Act 2021. Despite these achievements, many challenges in the energy sector seem to undermine the drive for carbon neutralization by 2060 (Walsh et al, 2021).

COP30 showcased the climate-action milestones and remarkable achievement of Katsina State presentation highlighted the government's commitments to sustainable development, environmental resilience and innovative climate solutions that continue to place Katsina State at the forefront of climate-action in Nigeria. Katsina State under State Project Management Unit (SPMU) planned and executed phase I of the town's stormwater management system, and drainages in flooding affected areas. However, death and damage had not been eradicated. The state government therefore, constructed Phase II to address flooding to protect lives and properties damages, which could maximise economic prospects in the vicinity of the impacted residential settlements (Sani, 2026).

Katsina State government commenced a 16-month stormwater intervention atKatsina Central, concluded in 2025. Katsina Town Stormwater Drainage Management executed over 9 kilo meters, restores 2,050 hectares and directly and indirectly affects 1.5 million individuals. In Batagarawa areas under the project of Riverbank Protection restore 1,518 hectares, affect 0.87 million individuals.

Problem Statement

Climate change represents one of the most significant challengesfacing the global landscape in the 21st century. Anthropogenic activities, specifically, deforestation and the use of fossil fuels are propelling this alteration by elevating atmospheric levels of carbon dioxide and other greenhouse gases (Abaje, Ogoh, Amos, &Abashiya, 2015). Due to this, the world is encountering intensified weather extremes, alterations in precipitation patterns, heats and cold waves, as well as escalating droughts and floods. Floods is among the most expensive climate-related calamities of 2025, at which amounted to over $120 billion in losses covered by insurance. Incidents of floods in DR Congo threaten 10 million inhabitants with evacuation, and also in India and Pakistan, around 1,860 individuals have been killed, incurring significant costs about $6 billion, and impacting more than seven million individuals in Pakistan (Patrick, 2025).

In Nigeria, unprecedented floods were recorded, with over thousands deaths and property worth billions of naira affected. April 2025, Nigeria has experienced flooding events that have caused property damage, loss of cultural heritage, fatalities, injuries and displacement. The deadliest among such incidents was the 2025 Mokwa flood in May that killed at least 500 people. (Sani, 2026).

Flooding is the principal environmental concerns facing Katsina State, at which pose a significant threat to fundamental infrastructures, like farmland, streets, homes among others. The State being one of the frontline states neighbouring Niger Republic, which possesses its own intricate interconnection mostly driven by actions and natural processes of inhabitants at communities. During each rainy season, numerous streets in communitiestransform into rivers and rapidly inundate, loss of lives, properties damage valued at millions as a result of floods due to building on waterways, absent of drainages or badly constructed drainages, excessive deforestation and land excavation, at which many homes, communities, farmlands,learning areas, hospitals are at risk of climate shocks (Ogbonna et al, 2023).

According to ACReSAL report, floods had transpired in other places like Katsina, Batagarawa LGAs, at which farmers lost a total of 1.7billion value of agricultural output annually during the past decade as a result of flooding inTudunMatawalle – GadarNayalli – KofarKaura – KofarMarusa – KofarDurbi – KofarSauri river. But now, the state government has addressed 70% of this issue (Sani, 2026).

Research Questions

This paper aimed to delineate the positive impacts for COP decisions on flood-affected communities in Katsina state. However, the questions are:

i. What is the socio-economic characteristics of flooding communities at Katsina State?

ii. What are the root-cause for climate vulnerability among the flooding communities at Katsina State?

iii. How COP decisions contributed to loss and damages caused by climate event among the flood-affected communities at Katsina state?

Literature review

COP's and flooding

COP implements climate finance mechanisms to support developing countries in addressing climate challenges. Despite these provision, Nigeria faces significant barriers in accessing such funds. Bureaucratic hurdles,

stringent application criteria, and inadequate institutional capacity impede the effective utilization of international financial support (OECD, 2023). Loss and damage mechanisms are gaining traction as essential tools for addressing irreversible climate impacts. Nigeria frequently affected by floods, droughts, and desertification, stands to benefit from such mechanisms. Though, the operationalization of loss and damage financing has faced resistance in international negotiations, delaying support for vulnerable countries (UNEP, 2024).

The 2022 flood disaster, deemed the most catastrophic in Nigeria's history, impacted over 30% of the countryand resulted in the deaths of over 600 individuals, and over 2 million individuals relocated, with the actual cost still to be ascertained (Ominabo, 2022). Nigeria witnessing rapid growth population by 3.2% of each year, in comparison to current population of 216 million individuals(FGN, 2021).

According to Abaje, Ogoh, Amos and Abashiya (2015); in 2012 - 2013, the devastating consequences of flooding in Nigeria reached a critical point, resulting in it being perceived as a national calamities. Katsina state was one of the states that endured a severe flood event. Homes and other infrastructures were relocated. Analysing the response to flood event on infrastructure facilities indicated that streets severely affected,confirmed by 46.5% of the respondents. The enormous devastation of infrastructuresthat flood-inducedsignificantly impacted health, and other social amenities. The collapsed of bridges (i.eShagari low cost bridge along Katsina to Batsari Road) cut-off numerous towns, making it challenging to provide healthcare and tough to persuade people to help flood victims.

COP Decisions

i. Safeguarding food Security and ending hunger

The COP cover decision that "safeguarding food security and ending hunger" is a fundamental priority, and that communities can better protect themselves from climate effects if water systems are protected and conserved. The COP recognised how food shortages could continue to be driven by climate change. This is progress as the Glasgow Climate Pact (2021) made no mention of agriculture, food or water. However, the decision doesn't have new dedicated funding for food systems from governments. Intergovernmental Panel on Climate Change (IPCC) estimate that food systems are responsible for between 21% and 37% of global emissions. Martin (2025) estimated that 42% of recent food price inflation has been due to climate change. In its report the Word Bank warns of 'human catastrophe' food crisis.

ii. Koronivia joint work on agriculture

The Koronivia Joint Work on Agriculture (KJWA) addresses issues related to agriculture, including through workshops and expert meetings, with consideration of vulnerabilities of agriculture to climate change, as well as approaches to addressing food security. Under these item negotiations focused on considering the next phase of KJWA, including an enhanced joint work programme. The COP urges Parties and other stakeholders to increase their efforts to promote sustainable agriculture, with a view to eradicating hunger and poverty while ensuring food security.

iii. Boosting low emission energy

Matters relating to the Work Programme for Urgently Scaling up Mitigation Ambition and implementation Mitigation Work Programme

(MWP) were mandated by the Glasgow Climate Pact and aims to explore ways to raise mitigation ambition before 2030. During the negotiations the main disagreements were about identifying new categories of countries, such as "major emitters" or "vulnerable developing countries", and timeframe of the Mitigation Work Programme (MWP), especially the end date (to conclude in 2023 or 2030) and actions. The final decision emphasized the urgent need for increasing efforts to reduce collectively emissions through accelerated action and implementation of domestic mitigation measures to achieve the Paris Agreement goal, and Parties were requested to revisit and strengthen the 2030 targets in their Nationally Determined Contributions (NDCs), aligning them with their long-term low greenhouse gas emission development strategies.

iv. New collective quantified goal on climate finance

The Paris Agreement states that a new collective quantified goal on climate finance (NCQG) shall be set prior to the 2035, from a floor of $300 billion per year. Subsequently, in Glasgow Parties decided that their work will be organized in an ad hoc work programme (including technical expert dialogues (TED), submissions, ministerial dialogues, and stocktakes and guidance. At the negotiations there were discussion on the level of the new goal, with developing countries seeking to reference the need for trillions rather than billions of dollars, while developed countries considers that it was premature to consider a "quantum", or numerical financial goal. Also, there were significant debates on the sources of support.

Theoretical Framework

This research is anchored on Environmental Justice Theory. Theory is essential part of social science research because it sets theoretical orientation where the practical aspects of the research are considered by making sense of the observed patterns. Theory also help to shape and provide a sense of direction to research. In this, fundamentally rooted in the Environmental Justice Theory.

Environmental Justice Theory

The theoretical framework also draws from Environmental Justice Theory, which focuses on equitable access to environmental benefits and protection from environmental harm. This theory, introduced by scholars like Robert Bullard in the late 20th century, provides insights into addressing socioeconomic disparities in climate adaptation. It resonates in Nigeria's efforts to integrate local communities into climate mitigation programs, ensuring marginalized groups are empowered and actively participate in decision-making processes (Tunde et al. 2013).

The core assumptions of Environmental Justice Theory in relation to climate change mitigation are based on the following ideas;

Firstly, environmental harms are unequally distributed: Environmental risks disproportionately affect marginalized communities (low-income groups, Indigenous peoples, racial minorities, and the Global South). Therefore, in climate mitigation effort, fossil fuel pollution and climate impacts (heatwaves, flooding, air pollution) are not experienced equally. Climate mitigation policies must prioritize communities most affected by emissions and climate risks. For instance; the transitioning away from coal plants in overburdened neighbourhoods.

Secondly, vulnerable populations contribute least to environmental degradation but experience the greatest harm, because those least responsible often suffer most. Therefore, in climate Mitigation, high-emitting countries bear greater responsibility for reducing greenhouse gases. Supports principles like "common but differentiated responsibilities" seen in global climate agreements such as the United Nations Framework Convention on Climate Change and the climate finance and loss-and-damage funds align with this assumption.

Lastly, environmental policies should not unfairly burden disadvantaged groups. Therefore, in climate Mitigation, carbon taxes must avoid regressive impacts, and the renewable energy access should benefit low-income households. Just transition policies should protect workers in fossil fuel industries.

Methodology

Study Area

Katsina State is the study area for this study, which situated in Northwest region of Nigeria. Katsina has a landmass of 24,192 1km2 (9,341 square miles) and estimation population of 11.6 millionindividualsbased on demographic projections by World Bank. Katsina State sharing its south boundary with Kaduna State, east boundary with Jigawa and Kano States, west boundary with Zamfara State, whileits north boundary with Republic of Niger.

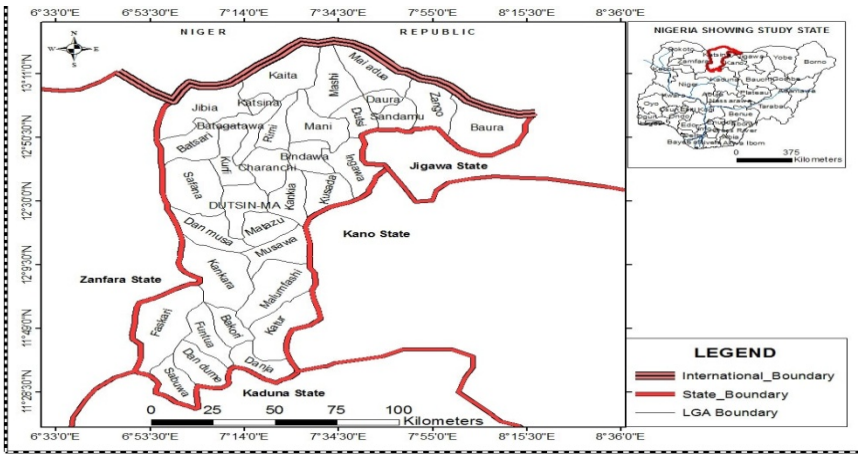


Figure I: Katsina Map

Source: Bankole and Vincent (2021)

Katsina State's Weather

According to Koppen, Katsina state has a tropical wet and dry climate. The rainfall typically falls between May and September, peaking in August, while the dry season commenced October to April with very low humidity coupled with increased temperature (Abaje et al, 2012)..

Sampling procedure and sample size

This is the actual section of the population that either has an obvious connection with the phenomenon under investigation or can be accessible by the researcher. This means that not at the elements in the population can be utilised for the study in the process of generating a required data. However, in this case, six (6) local

government areas selected (Katsina, Batagarawa, Daura, Baure, Funtua, and Malumfashi), i.e two from each Senatorial Zones of Katsina State. Therefore, the population of the study constituted 119 students enrolled at Meteorological Institute of Science and Technology (MIST) in 2025, 371 Farmers affected by drought, and 859 Households affected by flood disaster. It made the total target population were 1,349.

Krejcie and Morgan's table used to select 297 individuals from 3 categories mentioned across six (6) selected local government areas. The distribution was made based on the number of people in the categories and in the local government areas by making use of simple percentage as described below:

Table 1: Sample Size of the Respondents

SENATORIAL ZONES	LGAs	MIST Students	SAMPLE SIZE	Flood-affected farmers	SAMPLE SIZE	Flood-affected households	SAMPLE SIZE
Katsina Central	Katsina	40	34	105	28	152	18
	Batagarawa	28	24	88	24	121	14
Katsina South	Funtua	11	09	16	04	198	23
	Malumfashi	09	08	21	06	145	17
Katsina North		19	16	81	22	130	15
	Daura	12	10	60	16	113	13
	Baure						
TOTAL		**119**	**101**	**371**	**100**	**859**	**100**

Source: Field Work (2026)

As indicated in **Table 1** out of the 119 students enrolled at Meteorological Institute of Science and Technology (MIST) in 2025, only 101 were selected across the institution to serve as sampled from whom information was generated via questionnaires. As for flood-affected farmers, 100 were selected out of 371 to serve as samples. Similarly, 100 out of 859 flood-affected Households were selected. However, with regard to the people interviewed, six (6) official personnel were selected from three (3) selected organisations namely; two (2) ACReSAL staffers, two (2) NESREA staffers, and two (2) Katsina State Climate Change Secretariat (KTSCCS) staffers. In addition, various documents were analysed, depending on accessibility and relevance for the content analysis method.

Data collection method

The primary informationwas obtained using astandardised questionnaire and key informant interview. The information collected from flood-affected farmers, flood-affected households and MIST students including their socio-economics characteristics.

Data analysis

The informationobtained was analysed using a Descriptive Statistical Tool. The purpose of which was to present to-be collected data in a

summary form which was made it easier for the researcher made meaning out of it. The version of the SPSS used to describe the summarised data through SPSS IBM 23.

Findings

Respondents' socio-economic characteristics

This section outlined a fundamental Bio-Data of the sampled respondents as presented in the table below:

Table 2: Respondents' Bio-Data

VARIABLES		***F***	***%***
Sex	Male	216	74.2
	Female	75	25.8
Age	18 – 25	94	32.3
	26 – 35	61	21.0
	36 – 45	86	29.6
	46 – 55	29	10.0
	56 and above	21	7.2
Education qualification	Primary	30	10.3
	Secondary	113	38.8
	Tertiary	115	39.5
	Informal	33	11.3
Occupation	Student	100	34.4
	Business	29	10.0
	Farmer	93	32.0
	Civil servant	35	12.0
	*Other	34	11.7

*Other: Mechanic, Widow. Watchman

Source: Fieldwork, 2026

The respondents' bio-data examined in table 2 revealed that a total number of 216 males, while 75 females were interviewed. The largest number came from male respondents. Age distribution, it demonstrates a significant proportion of the sampled respondents to whom copies of questionnaire administered were 241 people belong to the age bracket of 18 – 45, while the remaining 50 people belong to the age bracket of 46 and above.

With respect to the educational attainment of the sampled respondents shows the majority of them have acquired formal qualifications at different levels. This illustrated by the fact that only 33 people have no formal education, while a combined total of 258 people possessed educational qualification that enable them at least be able to read and write in their mother tongue while many of them can understand English language. The occupation distribution showcases that 100 people were identified as students, 93 people were listed as farmers, 35 people were civil servants. Additionally, 34 people were identified as Others (mechanic, widow, and watchman), and 29 people were also identified as business people.

Awareness on Conference of Parties

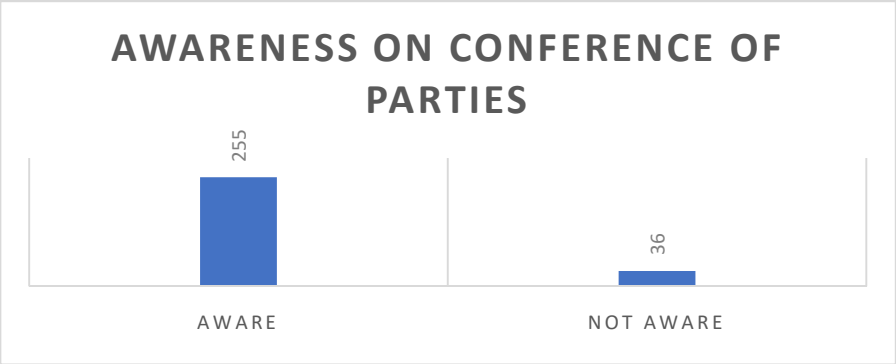


Fig 1: Source: Fieldwork, 2026

With regard to the awareness on Conference of the Parties, Fig 1 indicates 255 sampled respondents were aware on COP activities. This illustrated by the fact that only 36 were not aware on COP existence and activities. Therefore, it is a clear indication that the COP's objectives can easily be achieved in Katsina State, and the communities have witnessed a positive impact of COP activities.

Climate Awareness

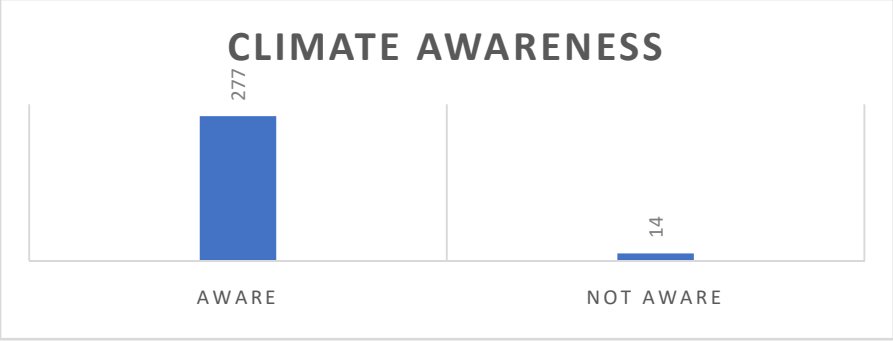


Fig 2: Source: Fieldwork, 2026

Fig 2 illustrated by the fact that 277 individuals were informed and knowledgeable about climate, while only 14 individual were not knowledgeable about climate. Regarding the individuals percentage that were knowledgeable about climate, it indicated that COP's objective can easily be achieved, and communities can easily understand the initiatives and training when they were to be given as they are already in possession of experiences and knowledge about safeguarding environment and improving carbon neutrality among our local communities.

Table 3: Root-cause of climate vulnerability among the flood-affected communities in Katsina State (*N = 291*)

Variables	SA = 5 (%)	A = 4 (%)	D = 3 (%)	SD = 2 (%)	U = 1 (%)
Natural process	239 (82.1)	47 (16.2)	3 (1.0)	1 (0.3)	1 (0.3)
Emission from vehicles and industries	226 (77.7)	60 (20.6)	3 (1.0)	1 (0.3)	1 (0.3)
Urbanization	212 (72.9)	73 (25.1)	4 (1.4)	1 (0.3)	1 (0.3)
Deforestation	216 (74.2)	70 (24.1)	3 (1.0)	1 (0.3)	1 (0.3)
Overgrazing	204 (70.1)	72 (24.7)	6 (2.1)	3 (1.0)	6 (2.1)

Source: Fieldwork, 2026

Table 3 demonstrated that 98.3% individuals believe that natural processes are the primary causes of creating climate vulnerability among flood-affected individuals because the Katsina towns lies at semi-arid Sahel region, at which these natural processes are beyond human control that heavily affected livelihoods, agriculture and water resources. Data in Tablealso demonstrated that 98.3% individuals agree that emission from our vehicles and industries are part of the root cause of climate vulnerability among flood-affected communities in Katsina State because they release gases and air pollutants that disrupt the earth's climate system and weaken communities' ability to cope with environmental changes.

Table 3 illustrated that 98.0% individuals expressed agreement that urbanization is the major driver of climate vulnerability among flood-affected individuals because the Katsina population rapidly increasing, buildings and infrastructures developed into small areas are also increasing, while natural land is replaced with roads and houses which reducing water absorption. Data in Table 3 reveals that deforestation as a primary cause of climate vulnerability among flood-affected communities in Katsina State because the State is already in semi-arid (dry) region, at which the communities become more vulnerable to floods, drought and extreme heat. This assertion, as seen in Table 3 received the endorsement of 98.3% individuals. Table also indicated that 94.8% individuals agree that overgrazing is one of the root cause of climate vulnerability among flood-affected communities in Katsina State because the State is semi-arid region and heavily dependent on livestock and farming.

Table 4: Contributions of COP decisions to loss and damages caused by climate event among the flood-affected communities in Katsina state. ***(N = 291)***

Variables	**SA = 5 (%)**	**A = 4 (%)**	**D = 3 (%)**	**SD = 2 (%)**	**U = 1 (%)**
Long-term climate finance	226 (77.7)	59 (20.3)	4 (1.4)	1 (0.3)	1 (0.3)
Preventing hunger and ensuring food security	212 (72.9)	73 (25.1)	4 (1.4)	1 (0.3)	1 (0.3)
Defensible space for flood risks reduction	222 (76.3)	64 (22.0)	3 (1.0)	1 (0.3)	1 (0.3)
Boosting low emission energy	217 (74.6)	66 (22.7)	3 (1.0)	2 (0.7)	3 (1.0)
Phase down coal use	222 (76.3)	63 (21.6)	3 (1.0)	1 (0.3)	2 (0.7)

Source: Fieldwork, 2026

Table 4 reveals that 98.0% individuals agree long-term climate financeis part of the COP's contribution to loss and damages caused by climate event among the flood-affected communities in Katsina State because it allows government, farmers and households to move from reactive responses to targeted long-term solutions. As seen in Table 4 shows that 98.0% of the sampled respondents agree preventing hunger and ensuring food security is part of COP's contribution to loss and damages caused by climate event among the flood-affected communities in Katsina State to address poverty, environmental issues, health and socio-economic risks that make communities vulnerable to climate event.

Regarding a policy implementation of COP decisions effort that provided a defensible space for flood disaster which reduced communities' vulnerabilities because it is significantly reducing climate shock as seen in Table 4 that signifies a positive impact. This assertion was confirmed by cumulative responses 98.3% of the sampled respondents. Data in the Table 4 also indicates that 97.3% of the sampled respondents agree that boosting low emission energy is part COP's contribution to loss and damages caused by climate event among the flood-affected communities in Katsina State, especially given Katsina exposure to desertification, erratic rainfall and conflict pressure. According to the data in Table 4 also reveals that 97.9% of the sampled respondents confirmed that phase down coal use is part of the COP's contribution to loss and damages caused by climate event among the flood-affected communities in Katsina State where floods, droughts and extreme heat are common found in communities. But policies properly implemented, a climate vulnerability will reduce by saving lives, protecting livelihoods and strengthening long-term resilience.

Conclusion/Recommendation

The results of this investigation indicate that the large proportion of flood-affected communities in the study area acknowledged the positive impacts COP decisions on flood events, which caused a vulnerability factor by denying many communities of the most basic necessities, and placing them in perilous situations. Therefore, the study concludes that sustained implementation of COP-related decisions, stronger collaboration among government agencies, development partners, and local communities as well as increased investment in climate adaptation are essential for achieving long-term resilience and sustainable development in flood-affected communities in Katsina State.

In line with this development, the study recommendations are as follow:

- **Strengthen implementation of COP commitments**: The Katsina state government should translate relevant COP decisions into state-level climate adaptation policies and ensure they are effectively implemented in flood-prone communities.

- **Promote local communities participation**: Local communities should be actively involved in planning, implementing, and monitoring climate adaptation and disaster risk reduction programmes to ensure interventions meet local needs.

- **Strengthen institutional coordination**: Greater collaboration should be encouraged among federal, state, and local government, as well as emergency management agencies, civil society organizations, and development partners to improve the effectiveness of flood response and adaptation measures.

- **Support sustainable livelihoods**: Programmes that provide financial assistance, agricultural inputs, skills training, and livelihood diversification should be expanded to help flood-affected households and farmers recover economically.

- **Improve environmental management**: Afforestation, watershed protection, proper waste management, and enforcement of land-use regulations should be promoted to reduce flooding and enhance environmental resilience.

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