



Climate Change Adaptation: An Examination of the Effectiveness of Indigenous Knowledge Systems among Rural Farmers in Akpanya Community, Kogi State, Nigeria

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Abstract

Our disregard for the Indigenous Knowledge Systems (IKS) contributes largely to the failure of state and non-state actors' intervention targeting climate change adaptation among rural farmers. In a study population of an estimated 19,800 predominantly rural farmers in the Akpanya community of Igalamela Local Government Area, Kogi State, North-Central Nigeria, this study was carried out to provide an understanding of the role of IKS in climate change adaptation. Using Indigenous Knowledge System theory and primary sources of data gathering and analysis methods through Focused Group Discussion and Interview Schedules the study found that farmers in the Akpanya community have over the years relied on IKS of traditional farming practices such as crop rotation and weather forecasting for climate change adaptation practices. It also, established that language barrier and the disregard for Indigenous knowledge are the greatest challenges facing Indigenous Knowledge Systems in the Akpanya community. This communication gap in the language barrier makes it difficult for younger farmers to understand IKS better and threatens its usage and sustainability in the community. The study concluded that IKS plays a fundamental role in climate change adaptation among rural farmers because it allows for homegrown solutions for environmental protection. The study recommended that climate change adaptation intervention by the state and non-state actors targeting rural farmers should recognize and integrate IKS to enable farmers to be actively involved in homegrown solutions that best safeguard their environment.

Keywords: Adaptation, Climate Change, Indigenous Knowledge, System, Community Farmers

Introduction

Globally, climate change is impacting communities and this has been corroborated by the 2023 Intergovernmental Panel on Climate Change report that discloses climate change impact across communities and interventions targeted at addressing it (Intergovernmental Panel on Climate Change-IPCC, 2001). The report shows Africa is hugely impacted by climate change resulting in food insecurity and competition over land and/or water resources. In a similar narrative, the World Bank forecast that climate change impact will result in the reduction of agricultural arable lands to 20% by 2080 in Sub-Sahara Africa, making the region exceed Asia with the highest food insecurity globally (Food and Agricultural Organisation, FAO 2009).

The 2011 Climate Change Department, an agency under the Federal Ministry of Environment points out how climate change is impacting Nigeria. According to the reports, climate change impact is resulting in poor agricultural yields and loss of

livestock farming, leading to food insecurity and the farmers losing income. The report recommends effective adaptation action because Nigeria is currently losing about 11% of its Gross Domestic Product (GDP) to climate, and will likely rise to 30% by the year 2050. The report approximated the loss to be between N15 trillion and N69 trillion. It shows notable climate change impact on a change in rainfall patterns, floods, and droughts, a weather condition that is altering the planting and harvesting seasons resulting in a decrease in crop yields and threatening livestock farming (Kelechi, et al 2022).

The Conflicts among farmers and herders have been traced to climate change impacts. The Internal Displacement Monitoring Centre report reveals that from the period 2015 to 2018, about 2,500 persons were killed and 62,000 displaced from their homes as a result of farmer-herder conflicts that were linked to climate change-related issues. Also, the International Crisis Group report reveals that in 2019, about 1,300 persons were killed and 300,000

persons displaced from their homes due to herder-farmer conflict associated with climate change impact. Furthermore, the Centre for Development and Democracy report reveals that about 71% of conflicts in Nigeria are linked to climate change issues (Akpan, 2023). The Nigerian state has shown commitment to addressing climate change through policy interventions such as the National Climate Change Policy for Nigeria 2021 – 2030 (2023), targeted at addressing climate change impacts and reducing greenhouse gas emissions.

Ibaji, Akpanya, and Ogbogbo are communities in Kogi state where rural farmers are losing crop yields, income and battling food insecurity as a result of climate change. The rural farmers are showing resilience to climate change and are relying on indigenous knowledge of land rotation and planting of cover crops for climate change adaptation strategies. Specifically, rural farmers in the Akpanya community who cultivate mainly yam, cassava, and maize lack agricultural extension workers and rely mainly on indigenous practices for climate change adaptation (Apeh, 2024). Historically, the Akpanya community has Indigenous Knowledge Systems and cultural practices that have enabled them to adapt to their environment for generations. Rural farmers in Akpanya have over the years relied on traditional farming practices such as crop rotation, weather forecasting, soil conservation, and the use of manure for soil nutrients as their Indigenous knowledge systems for climate change adaptation (Apeh, 2024).

A major gap in climate change interventions especially targeting the rural population is the inability of the state and non-state actors to recognize and integrate Indigenous knowledge systems and their roles in adaptation strategies and action. They often ignore Indigenous knowledge systems which put the locals in the best position and capacity to find solutions in the best way they live and interact with their environment. This gap contributes largely to why many climate change interventions by state and non-state actors targeting rural populations fail (Mawa, 2023).

This study sees indigenous knowledge as established traditionally accepted knowledge and practices of indigenous peoples, in their interaction

and relation among themselves and their environment. It defines rural farmers as persons who cultivate and manage agricultural land in rural villages, they often rely on traditional practices given to them through generations. They contribute significantly to food production and depend on agriculture for their livelihood and income.

The study adopts Indigenous Knowledge Systems (IKS) as a theoretical framework of analysis. George (2012), asserts that IKS plays a significant role in community development and cultural preservation that is instrumental to community development and sustainability. Linda (1999), posits that Indigenous people have knowledge systems that they have developed and relied upon over the years for their development and growth. She argues that the community's survival and struggle are rooted in its indigenous knowledge system. Makere (2005), points out that societies cannot be confined to a specific form of knowledge, cultural, and ideological framework. She argues that IKS is instrumental to the understanding of pedagogies. The IKS argues that every society has over a long period developed its unique philosophies and knowledge that govern its interaction and dealings with its natural environment. The philosophies and knowledge are so significant that they inform the basis on which society decides the fundamental aspects of their day-to-day life. It cannot be separated from society, it is integral to their culture that encompasses language, social classification, resource use practices, social interactions, ritual, and spirituality. Every society believes that its IKS is supreme and cannot be replaced with any other knowledge and that it is a critical connection in which they build sustainable social and economic development.

The main objective of this study is to examine the effectiveness of Indigenous Knowledge Systems in climate change adaptation among rural farmers using the Akpanya community in Igalamela Local Government Area of Kogi State as a case study. However, its specific objectives are to document and analyze the existing Indigenous Knowledge System used by rural farmers in Akpanya for climate change adaptation; assess the effectiveness of the Indigenous Knowledge System in enhancing climate resilience among rural farmers in the area;

and identify challenges and limitations of using the Indigenous Knowledge System for climate change adaptation among rural farmers in the area.

Within the context of this study, climate change adaptation is conceptualized as ways or means of adjusting or reducing climate change impacts on the people and the environment. Smit and Lazo (2001), assert that human actions aimed at reducing climate change impacts are fundamental to the environment and society. Ugwuanyi (2023), argues that the rural population should be properly educated on the importance of climate change adaptation. According to him, the education that results in rural population engaging in actions that will minimize climate change impact is vital because, if left unchecked, climate change impact will result in conflicts that will adversely affect the environment with farmers who rely on rainfall and good weather condition for agricultural practices likely to be the worst hit.

Ukpai (2024), argues that climate change adaptation is not only about human actions targeted at reducing climate change impacts but rather actions that help save society and human existence. He asserts that the process of climate change adaptation must be the one that allows communities to be actively involved in choosing the best adaptation practices that will yield better and more sustainable results that conform to their unique problems.

Ani (2024), opines that actions targeted at reducing climate change's impact on the people and society must be tailored in such a way that they will be

most suitable in addressing their needs and also have adequate regard for the target population's cultural sensitivity. According to him, state and non-state actors should not force foreign solutions on the locals, rather the locals should be allowed to be actively involved in solutions over issues that impact their environment. He argues that their active involvement will bring trust and sustainability among the people.

Materials and Methods

This study adopted the Akpanya community located in the Igalamela Local Government Area of Kogi State, North-Central Nigeria as a case study. The community primarily engages in subsistence farming, with crops such as maize, yam, and cassava as the main staples. The farmers are largely small-scale and resource-poor, with limited access to modern farming technologies, credit facilities, and extension services. Qualitative methods involving Focused Group Discussion (FGD) and Interview Schedule (IS) were used for data gathering and analysis. The FGD and IS were focused on the existing Indigenous Knowledge System used by rural farmers in Akpanya for climate change adaptation, the effectiveness of the Indigenous Knowledge System in enhancing climate resilience among rural farmers in Akpanya, and the challenges and limitations of using the Indigenous Knowledge System for climate change adaptation among rural farmers in Akpanya in line with the study objectives.

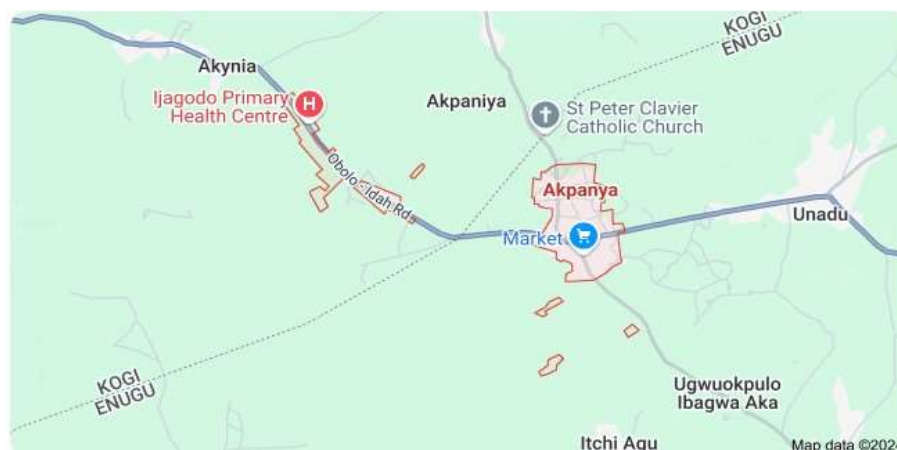


Figure 1: Study Area

Akpanya is in Igalamela Local Government, under the Kogi East Senatorial District, located about 89 kilometres away from Ajaka the headquarters. It shares boundaries with the Itchi, Unadu, and Ibagwa Agu communities of Enugu State. The study focused on rural farmers in Akpanya and examined the impact of climate change on agricultural practices, livelihoods, and adaptation strategies. The community experiences a tropical savanna climate with two distinct seasons, rainy and dry, and is characterized by high temperatures and humidity during the dry season.

Study Sample

Akpanya community has an estimated population of about 19,800. A total of 41 rural farmers from the Akpanya community participated in this study, 30 farmers in the interview schedules and 11 aged farmers in the Focused Group Discussion, providing a good sample size to explore the significance of the Indigenous Knowledge System in climate change mitigation and adaptation among rural farmers.

Results and Discussion

Although the Akpanya community case study is not a full representation of Nigeria, it gives an insight into how Indigenous Knowledge Systems play a significant role in climate change adaptation among rural farmers. The study found that IKS plays a key role in climate change adaptation among rural farmers in the Akpanya community.

25 out of 30 (83%) responses from the farmers in the Interview Schedule showed that farmers in Akpanya have over the years relied on IKS of traditional farming practices such as crop rotation, weather forecasting, soil conservation, and the use of manure for soil improvement as climate change adaptation practices. Information from 20 (66%) of the farmers show that crop rotation and the use of manure are the most effective climate change adaptation practices among rural farmers in the community. The information revealed that crop rotation and the use of manures strengthen soil nutrients and also allow for pest control which results in better crop yields. Responses from 22 (73%) of the farmers reveal that rural farmers in the community rely on weather forecasting by reading the sun and paying adequate attention to seasonal

calenderer to know the appropriate time for planting and the kind of crops to be cultivated.

Information from all 30 (100%) of the farmers showed that no farmer in the community has gotten training from the government or other organizations on climate change mitigation. It revealed that farmers rely on IKS inherited by their forefathers for climate change mitigation and agriculture practices. Information from 15 (50%) of the farmers affirmed that climate change is not new and older generations of farmers in the community had deployed IKS for sustainable agriculture and effective climate change adaptation practices.

All 11 (100%) older farmers in the Focused Group Discussion (FGD), affirmed that farmers in the Akpanya community have over the years relied on IKS for agricultural practices and climate change adaptation. 3 (10%) of the framers, explained how farmers in Enugu Ogboyaga village in Akpanya rely on IKS to read soil volatility. According to them, the farmers are knowledgeable enough to predict accurately the type of crops that will do better on a particular soil using IKS. For them, farmers have a better knowledge of climate change and have over the years deployed IKS for crop rotation, manure, and seasonal calendar as the most effective practices for climate change adaptation. All 11 farmers uniformly agreed that farmers' use of IKS is not only about climate change adaptation, but the most effective ways of achieving sustainable agriculture. The older farmers in the FGD appeal that climate change adaptation intervention targeting rural farmers should recognize IKS and ensure its integration to enable farmers to be actively involved in the implementation of homegrown solutions that are best suitable to them and their environment.

Information from 27 (90%) of the farmers for the interview, revealed that the use of IKS such as crop rotation, use of manure, and seasonal calendar, have proven to be the most effective climate change adaptation practices among rural farmers in the Akpanya community. Responses from 24 (80%) of the farmers showed that all farmers in the community rely solely on IKS for climate change adaptation and sustainable agricultural practices.

All 11 (100%) older farmers in the FGD, affirmed that farmers in Akpanya have over the years relied on IKS for effective climate change adaptation and sustainable agriculture. According to them the resilience among farmers in the community is largely dependent on their efficiency of IKS use. For them, IKS is not only about farming but rather the entire system that regulates the community norms and culture where farming and sustainable agriculture are made possible. The older farmers recommended that IKS must be sustained and passed on to generations because it is the foundation on which the society is built and managed.

Information from 26 (86%) of the farmers in the interview showed that language barriers and Indigenous knowledge marginalization are the greatest challenges facing IKS in the Akpanya community. According to them, the older farmers who are the custodians of IKS prefer the use of Igala language to convey them to the younger generation of farmers who do not understand the language but rather speak and understand Igbo and English languages better. According to them, this communication gap makes it difficult for younger farmers to better understand IKS and threatens its usage and sustainability among the younger generation. Responses from 27 (90%) of the farmers showed marginalization of the IKS as the greatest challenge facing its applicability and sustainability among the younger farmers. According to them, the younger farmers do not regard IKS seriously and see it as an outdated system that is incapable of solving societal problems.

All 11 (100%) of the older farmers in the FGD corroborated the information from farmers in the interview. According to them, language barriers and neglect of Indigenous knowledge are the greatest threats to IKS in the Akpanya community. According to them, the Igala language the elders rely on to communicate IKS to the younger generation is fast disappearing and is being replaced by the Igbo and English languages. For them, this makes it difficult for IKS to be passed on to the younger generation threatening its sustainability. 7 (70%) of the older farmers agreed that the negligence of Indigenous knowledge poses a huge challenge to IKS. According to them, the

younger generation does not respect and regard indigenous knowledge, and that poses a huge barrier to the sustainability of IKS in the Akpanya community. They recommended that IKS should be taught to the younger generation for them to have a better understanding of the role it plays not only in climate change adaptation practices and sustainable agriculture but also for a better understanding of the people and how they can effectively live and interact with their environment.

The study findings that showed the Akpanya community has over the years relied on Indigenous Knowledge Systems for climate change adaptation practices. Also, the community sees IKS as not only about farming but rather the entire system that regulates the community norms and culture where farming and sustainable agriculture are made possible, validate the adoption of Indigenous Knowledge Systems as the theoretical framework of analysis in this study. The theory postulates that every society has over a long period developed its unique philosophies and knowledge that govern its interaction and dealings with its natural environment. The philosophies and knowledge are so significant that they inform the basis on which society decides the fundamental aspects of their day-to-day life. It cannot be separated from society, it is integral to their culture that encompasses language, social classification, resource use practices, social interactions, ritual, and spirituality. This therefore makes the theory most appropriate for this study.

Conclusion

This study was carried out to provide an understanding of the Indigenous Knowledge System (IKS) role in climate change adaptation among rural farmers using the Akpanya community in Igalamela Local Government Area of Kogi State, North-Central Nigeria as a case study. The study established that farmers in the Akpanya community have over the years relied on Indigenous Knowledge Systems of traditional farming practices such as crop rotation, weather forecasting, soil conservation, and the use of manure for soil improvement as climate change adaptation practices.

Also, the farmers' resilience is largely dependent on their efficiency of IKS use while the Akpanya

community sees IKS as not only about farming but rather the entire system that regulates the community norms and culture where farming and sustainable agriculture are made possible.

However, language barriers and Indigenous knowledge marginalization are the greatest challenges facing Indigenous Knowledge Systems in the Akpanya community. Mainly because the older farmers who are the custodians of IKS prefer the use of Igala language to convey them to the younger generation of farmers who do not understand the language but rather speak and understand Igbo and English languages better, and this communication gap makes it difficult for younger farmers to better understand IKS and threatens its usage and sustainability among the younger generation in the community.

Recommendations

Based on the findings of the study, the following recommendations are made

- (1) Climate change adaptation intervention by the state and non-state actors targeting rural farmers should recognize the Indigenous Knowledge System and ensure its integration to enable farmers to be actively involved in implementing homegrown solutions that are best suitable for protecting their environment.
- (2) The state and non-state actors should support communities to teach and sustain the Indigenous Knowledge System because it is the foundation on which the society is built.
- (3) The Indigenous Knowledge System should be taught to the younger generation to enable them to have a better understanding of the role it plays not only in climate change adaptation practices and sustainable agriculture but also for a better understanding of the people and how they can effectively live and interact with their environment.

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