

IMPACT OF ECO-FRIENDLY AGROFORESTRY PRACTICES ON CLIMATE CHANGE VULNERABILITY AMONG RURAL DWELLERS IN OSHO FOREST RESERVE, SOUTHWEST NIGERIA

Adebayo Samson Adeoye¹✉, Isaac Oyekunle Oyewo², Oluwole Olalekan Oke¹, Adepeju Rebecca Falana³, Adekunle Sarafadeen Adetunji¹

¹Agricultural Extension and Management Department of The Federal College of Forestry, Ibadan, Forestry Research Institute of Nigeria, PMB 5087, Jericho Hill, Ibadan

²Agricultural Business Management Department of The Federal College of Forestry, Ibadan, Forestry Research Institute of Nigeria, PMB 5087, Jericho Hill, Ibadan

³Forestry and Environmental Technology Department of The Federal College of Forestry, Ibadan, Forestry Research Institute of Nigeria, PMB 5087, Jericho Hill, Ibadan

ABSTRACT

Rural communities, especially those reliant on agriculture and forest resources, encounter significant threats from climate change. The study explores the impact of eco-friendly agroforestry practices on climate change vulnerability among rural dwellers in Osho Forest Reserve. Using a multistage sampling technique, 100 respondents were selected, and data collected through questionnaires and interviews were analyzed with descriptive and inferential statistics. Findings revealed that about 58.0% of respondents had a family size of less than or equal to 5 persons, and 38% were between the age range of 31 to 40 years. Also, result showed that about 50.0% of respondents own land through inheritance while 38.0% of respondents have an annual income above ₦600,000 (\$413.35). In addition, findings revealed that most respondents were aware of eco-friendly agroforestry practices such as alley cropping, windbreak, live fence and hedge rows. Furthermore, the study demonstrated the effectiveness of eco-friendly agroforestry practices in mitigating climate change vulnerability. Soil conservation recorded the highest mean score ($m = 2.18$), ranking first, followed by carbon sequestration ($m = 1.98$) in second place, and reduction in greenhouse gas emissions ($m = 1.83$) in third. Chi-square analysis indicated that most respondents' socioeconomic characteristics; sex ($p = 0.250$), age ($p = 0.877$), and marital status ($p = 0.555$) were not significantly associated with the effectiveness of eco-friendly agroforestry practices. However, annual income ($p = 0.020$) exhibited a statistically significant relationship at $p < 0.05$. Further analysis using the Pearson Product Moment Correlation revealed a statistically significant but weak positive relationship between socioeconomic characteristics and the effectiveness of eco-friendly agroforestry practices in addressing climate change vulnerability ($r = 0.277$; $p = 0.005$). This approach highlights the potential of eco-friendly agroforestry to mitigate climate change and sustain rural livelihoods, recommending scaled-up support through climate-resilient practices, capacity building, community engagement, and forest restoration initiatives.

Keywords: adaptation, agroforestry, extreme weather, rural communities, livelihoods, forest reserve

INTRODUCTION

The environmental implications of agricultural practices and land-use change pose significant challenges to the pursuit of sustainable growth in Africa. Land-use conflicts and climate change have been identified as key factors driving agricultural land-use change in Africa (Baarsch et al., 2020; Olagunju, 2015). This process often involves the abandonment of existing cropland in favor of new areas, leading to the conversion of forest reserves into agricultural settlements (Asifat and Ogunbode, 2019). This deforestation trend is concerning, with projections indicating a significant decrease in forest cover and an increase in bare land and agricultural areas by 2030 (Estrada et al., 2021). The consequences of deforestation and forest degradation extend beyond land-use changes. Biodiversity loss is accelerated as wildlife habitats are destroyed, posing threats to vulnerable African species such as elephants, gorillas, and chimpanzees (Adeyemi and Ayinde, 2022; Nair, 2011a). Furthermore, forest loss has dire consequences for ecosystem services, particularly carbon sequestration. Place et al. (2021) highlight the substantial economic losses resulting from impaired ecosystem services due to deforestation, amounting to over 6.3 trillion US dollars, or 8.3% of global gross domestic product (GDP) in 2016. Forests play a crucial role as carbon sinks, absorbing carbon dioxide from the atmosphere and mitigating climate change. However, the loss of forests reduces this natural carbon storage capacity, leading to increased greenhouse gas emissions and further exacerbating climate change (Nair, 2011).

Climate change poses a significant threat to agricultural sustainability, particularly in vulnerable regions like the Sahel, underscoring the need for innovative mitigation strategies (Baarsch et al., 2020). Furthermore, organic fertilizer subsidies in West Africa have the potential to enhance food production while reducing the environmental impacts associated with synthetic chemical fertilizers (Sane et al., 2021). Nigeria serves as an instructive case for this study due to its significant agricultural sector, diverse ecosystems, and pronounced socioeconomic challenges. Nigeria's agricultural sector is pivotal to its economy, employing approximately 35% of the labor force and contributing about 22–25% to

the nation's Gross Domestic Product (GDP) (FAO, 2024). However, the country faces severe environmental sustainability issues, including deforestation, land degradation, and biodiversity loss (Adeyemi and Ayinde, 2022; Baarsch et al., 2020). Additionally, the agricultural sector is constrained by soil degradation, low productivity, and limited adoption of sustainable practices (Adeyemi and Ayinde, 2022; Peters et al., 2021), further compromising environmental health. Despite these challenges, there remains a limited understanding of the key factors driving the rapid decline in forest cover in Nigeria. By examining the interconnected drivers of environmental change and their impacts, this study provides a more comprehensive understanding of sustainability challenges and identifies potential solutions for policymakers. The study is timely given the urgent need to address climate change impacts and promote sustainable development in Nigeria (FAO, 2019).

Climate change threatens the livelihoods and well-being of farmers, particularly in sub-saharan Africa, where dependence on rain-fed agriculture leaves them vulnerable to climatic variability and flood-induced crop losses. The link between climate change, agriculture, and food security appears increasingly complex and severe, particularly in developing countries, due to their susceptibility to fluctuations in temperature and rainfall (Asifat and Ogunbode, 2019). The manifestations of climate change include rising flood occurrences, droughts, irregular rainfall patterns, rising temperatures, and other extreme events that are occurring with increasing frequency (Peters et al., 2021; Ayoade and Thota, 2023). These developments have detrimental effects on crops; for example, rising temperatures lower crop yields and intensify pest attacks, and irregular rainfall increases the risk of short-term crop failure and long-term yield losses (Peters et al., 2021). Consequently, climate change poses a significant challenge for food production, food security, and agriculture in almost all developing countries, including Nigeria. There have been calls to raise and strengthen resilience to climate change and the adaptive capacity of food systems, livelihoods, and nutrition in response to climate variability and extreme events (FAO, 2019). Therefore, this study assesses the impact of eco-friendly agroforestry practices on climate change vulnerability in the Osho Forest Reserve,

aiming to examine the socioeconomic characteristics of the respondents, identify eco-friendly agroforestry practices, and examine the impact of these practices on climate change vulnerability. The study tested the following hypotheses: (i) there is no significant relationship between the socioeconomic characteristics of respondents and the effectiveness of eco-friendly agroforestry practices in the study area; and (ii) there is no significant correlation between respondents' socioeconomic characteristics and the effectiveness of eco-friendly agroforestry practices in the study area.

MATERIALS AND METHODS

Study area

Osho Forest Reserve is situated in the derived savanna ecological zone of Nigeria. It is located in the Ido Local Government Area of Oyo State, Nigeria. The area lies between latitudes $7^{\circ}28' N$ ($7.4667^{\circ} N$) and longitudes $3^{\circ}39' E$ ($3.6500^{\circ} E$) (Fig. 1). The reserve sits at

152 m (522 ft) above sea level. It covers an estimated land area of about 3,500 hectares, a substantial proportion of which remains under forest cover, comprising predominantly secondary forest interspersed with plantation stands and derived savanna vegetation. The rainy season in the area runs from April to July and from September to November, with a dry spell in August. The average annual rainfall is approximately 1257mm. Mean temperature ranges from $21.00^{\circ}C$ to $31.30^{\circ}C$. Relative humidity ranges from 84.5% between June and September to 78.8% between December and January (Popoola and Adesoye, 2012). The predominant occupations of the people living in Osho Forest Reserve are farming, basket weaving, and palm oil production (Popoola and Adesoye, 2012).

Sampling procedure and data collection

A multistage sampling procedure was used to select respondents in the Osho Forest Reserve area. In the first stage, Osho Forest Reserve was selected purposively

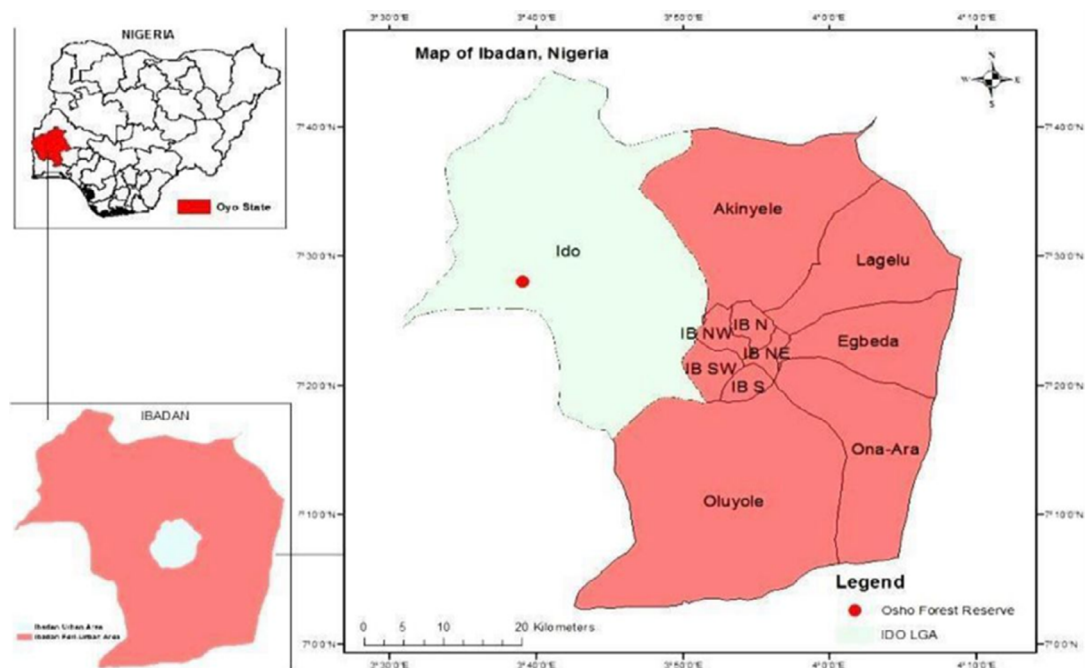


Fig. 1. Map of Osho forest reserve
Source: Popoola and Adesoye (2012).
Rys. 1. Mapa rezerwatu leśnego Osho
Źródło: Popoola i Adesoye (2012).

on account of the rural dwellers in the communities adjoining the reserve. The communities adjoining the reserve include Onikanaga, Agbetu, Onifufu, Mabole, Alatori, Abokede, Olorode, Adedapo, and Gbagba. In the second stage, a survey was conducted among community members surrounding the Osho Forest Reserve, and four of these communities were randomly selected, namely Agbetu, Onifufu, Abokede, and Onikanga; 25 questionnaires were distributed in each community. Data for the study were collected from primary sources using a structured questionnaire supplemented by interview sessions conducted during the rainy season, between 10th May and 5th July 2025. A total of 100 questionnaires were administered. The data were analyzed using both descriptive and inferential statistics; specifically, chi-square and Pearson Product Moment Correlation were used to test the hypotheses, processed through the IBM SPSS Statistics version 20 package.

Measurement of variables

The following criteria were used:

1. Table 1: Socioeconomic Characteristics of the Respondents:
 - i. Age: Respondents were asked to state their age as at the time of the study, recorded in intervals (e.g., 20–30 years).
 - ii. Sex: Respondents were asked to indicate their sex, which was measured at the nominal level (male = 1, female = 2).
 - iii. Marital status: Respondents were asked to indicate their marital status, which was measured at the nominal level (e.g., single = 1, married = 2, divorced = 3, widowed = 4).
 - iv. Annual income: Respondents were asked to indicate their annual income from farming and agroforestry practices, which was recorded in categories and measured at the ordinal level (e.g., <₦10,000 = 1; ₦10,001–₦15,000 = 2).
 - v. Years of experience: Respondents were asked to indicate their years of experience, which was recorded in categories and measured at the ordinal level (e.g., <5 years = 1; 6–10 years = 2).
2. Table 2: Awareness of Eco-Friendly Agroforestry Practices among Rural Dwellers: Respondents' awareness was operationalized on a 2-point scale (Yes = 1; No = 0).

3. Table 3. Impact of Eco-Friendly Agroforestry Practices on Climate Change Vulnerability: Respondents' ratings of impact were operationalized on a 4-point Likert scale (Highly effective = 3; Moderately effective = 2; Rarely effective = 1; Not effective = 0).

Analytical tools

- i. Chi-square test

$$\chi^2 = \sum \left[\frac{(f_o - f_e)^2}{f_e} \right] \quad (1)$$

Where:

χ^2 = Chi-Square statistic

Σ = Summation symbol, indicating the total sum

f_o = Observed frequencies of the qualitative variables in the study

f_e = Expected frequencies of occurrence, derived from the distribution of response categories

- ii Pearson product moment correlation

$$r = \frac{N \sum XY - \sum X * \sum Y}{\sqrt{[N \sum X^2 - (\sum X)^2] * [N \sum Y^2 - (\sum Y)^2]}} \quad (2)$$

Where:

r = Correlation coefficient

X = Values of the independent variable

Y = Values of the dependent variable

Σ = Summation symbol, indicating the total sum

RESULTS AND DISCUSSION

Socioeconomic characteristics of respondents

Table 1 presents the socioeconomic characteristics of the sampled respondents. The results show that the majority of respondents are male (60.0%). This suggests that farming is predominantly practiced by men, likely due to the labor requirement of crop production and their roles in household decision-making. This finding corroborates Aigbokie et al. (2021), who reported that the labor utilization of male farmers significantly exceeds that of female farmers in rural areas. About 38.0% of respondents fall within the 31–40 years age range. This indicates that a substantial proportion of respondents are in their youthful and active years, suggesting a greater capacity for physical work and decision-making regarding agroforestry practices to address climate change vulnerability. This is consistent

Table 1. Socioeconomic characteristics of respondents
Tabela 1. Charakterystyka społeczno-ekonomiczna respondentów

Socioeconomic variables	Frequency	Percentage
Sex		
Male	60	60.0
Female	40	40.0
Age, years		
20–30	23	23.0
31–40	38	38.0
41–50	29	29.0
Above 50	10	10.0
Marital Status		
Single	37	37.0
Married	50	50.0
Divorced	9	9.0
Widow	4	4.0
Annual Income, ₦		
<150,000	7	7.0
150,001–300,000	13	13.0
300,001–450,000	19	19.0
450,001–600,000	23	23.0
≥600,000	38	38.0
Years of Farming Experience		
1–10	50	50.0
11–20	25	25.0
21–30	18	18.0
>30	7	7.0

Source: field survey, 2025.

Źródło: badania terenowe, 2025.

with Bamwesigye et al. (2024), who reported that youths are more willing to actively participate in agroforestry initiatives for improved rural well-being. In addition, the study revealed that 50.0% of respondents are married. This suggests that a substantial proportion

of respondents may have family responsibilities that could influence their livelihood decisions. This finding is also consistent with Perelli-Harris et al. (2019), who reported that married individuals tend to have higher subjective well-being than unmarried individuals. Furthermore, the study reveals that about 38.0% of respondents earn above ₦600,000 per annum. This suggests that a proportion of rural dwellers in the adjoining communities derive substantial income from agroforestry-related activities. This indicates that agroforestry practices in Osho Forest Reserve (OFR) provide meaningful economic benefits to some farmers. This finding is consistent with Olatoye et al. (2025), who reported that agroforestry practices are profitable and contribute positively to farm income among rural dwellers. Since the outcome of the study indicates that 50.0% of respondents have 10 years or less farming experience. This suggests that a significant proportion of respondents are relatively early in their farming careers. This finding contradicts Afodu et al. (2022), who reported that a large proportion of farmers have accumulated at least 10 years of farming experience, contributing to skills development over time.

Awareness of eco-friendly agroforestry practices

Table 2 presents the level of awareness of eco-friendly agroforestry practices in the study area. The results show that the majority of respondents (70.0%) are aware of alley cropping, with a mean score of 0.70, ranking 1st. This indicates a high level of awareness and suggests a growing recognition of alley cropping as a viable practice for enhancing soil fertility, increasing crop yields, and reducing erosion. This finding is consistent with Mbow et al. (2014), who reported that alley cropping improves microclimatic conditions and biomass production, making it particularly suitable for smallholder farmers in tropical regions. The results further reveal that 62.0% of respondents are aware of windbreaks, with a mean score of 0.60, ranking 2nd. Additionally, 53.0% of respondents are aware of live fences (mean = 0.53, ranked 3rd), while 51.0% are aware of hedgerows (mean = 0.51, ranked 4th). This suggests that, although these practices are known among respondents, their level of awareness is relatively lower compared to alley cropping. However, live fences and hedgerows are known to serve dual functions of land demarcation and ecosystem service

Table 2. Awareness of eco-friendly agroforestry practices among rural dwellers

Tabela 2. Świadomość ekologicznych praktyk agroleśnych wśród mieszkańców obszarów wiejskich

Agroforestry Practices	Awareness		Mean	Rank
	Yes	No		
Alley cropping	70 (70.0)	30 (30.0)	0.70	1st
Windbreaks	62 (62.0)	38 (38.0)	0.60	2nd
Live fence	53 (53.0)	47 (47.0)	0.53	3rd
Hedgerows	51 (51.0)	49 (49.0)	0.51	4th

Source: field survey, 2025.

Źródło: badania terenowe, 2025.

provision. According to Nair (2011b), the relatively lower awareness of such practices highlights a potential gap in agroforestry extension services.

Impacts of eco-friendly agroforestry practices on climate change vulnerability

Table 3 highlights rural dwellers' perceptions of the impacts of eco-friendly agroforestry practices on

Table 3. Impacts of eco-friendly agroforestry practices on climate change vulnerability

Tabela 3. Wpływ ekologicznych praktyk agroleśnych na podatność na zmiany klimatu

Impacts	Effectiveness				Mean	Rank
	HE	ME	RE	NE		
Carbon sequestration	29 (29.0)	45 (45.0)	20 (20.0)	6 (6.0)	1.97	2nd
Soil conservation	50 (50.0)	28 (28.0)	12 (12.0)	10 (10.0)	2.18	1st
Climate regulation	12 (12.0)	31 (31.0)	35 (35.0)	22 (22.0)	1.33	11th
Improved water cycle	12 (12.0)	31 (31.0)	42 (42.0)	15 (15.0)	1.40	11th
Biodiversity conservation	11 (11.0)	40 (40.0)	34 (34.0)	15 (15.0)	1.47	10th
Enhanced food security	15 (15.0)	34 (34.0)	36 (36.0)	15 (15.0)	1.49	9th
Income generation	12 (12.0)	28 (28.0)	43 (43.0)	17 (17.0)	1.35	12th
Reduced greenhouse gas emissions	32 (32.0)	31 (31.0)	25 (25.0)	12 (12.0)	1.83	3rd
Decreased use of fossil fuels	15 (15.0)	44 (44.0)	33 (33.0)	8 (8.0)	1.66	4th
Improve adaptive capacity	11 (11.0)	30 (30.0)	39 (39.0)	20 (20.0)	1.32	14th
Enhanced resilience to climate-related shocks	20 (20.0)	35 (35.0)	28 (28.0)	17 (17.0)	1.58	7th
Reduced risk of crop failure	15 (15.0)	43 (43.0)	29 (29.0)	13 (13.0)	1.60	6th
Improved human health and well-being	13 (13.0)	23 (23.0)	50 (50.0)	14 (14.0)	1.35	12th
Increased community cohesion and cooperation	17 (17.0)	35 (35.0)	31 (31.0)	17 (17.0)	1.52	8th
Enhanced ecosystem functioning	12 (12.0)	47 (47.0)	35 (35.0)	6 (6.0)	1.65	5th

Note: HE = Highly Effective; ME = Moderately Effective; RE = Rarely Effective; NE = Not Effective.

Source: field survey, 2025.

Notka: HE = wysoko skuteczne; ME = umiarkowanie skuteczne; RE = rzadko skuteczne; NE = nieskuteczne.

Źródło: badania terenowe, 2025.

climate change vulnerability. Approximately half of the respondents (50%) perceived soil conservation as highly effective, with a mean score of 2.18, ranking 1st among the identified impacts. This finding aligns with global evidence that agroforestry enhances soil health by increasing organic matter, reducing erosion, and improving soil structure (Mbow et al., 2014; Weerasekara et al., 2016). Carbon sequestration, with a mean score of 1.97, and ranked 2nd, was also widely recognized (45.0%) as a key climate mitigation benefit. This supports the notion that communities are aware of agroforestry’s capacity to absorb atmospheric CO₂ through increased tree cover and biomass, thereby contributing to long-term carbon storage (Glover et al., 2020; FAO, 2024). Furthermore, the reduction of greenhouse gas emissions was ranked 3rd with a mean of 1.83, indicating a high level of awareness of agroforestry’s role in reducing emissions through decreased reliance on synthetic fertilizers and improved land-use practices. Decreased reliance on fossil fuels, with a mean score of 1.66 and ranked 4th, further underscores the relevance of agroforestry in reducing dependence on fossil energy sources. This finding also supports the position of Glover et al. (2020) and FAO (2024), who noted that agroforestry plays a significant role in mitigating climate change and reflects an understanding of long-term adaptive processes among practitioners. Enhanced ecosystem functioning was

ranked 5th (mean = 1.65), followed by reduced risk of crop failure (6th), enhanced resilience to climate-related shocks (7th), increased community cohesion (8th), enhanced food security (9th), and biodiversity conservation (10th). Climate regulation and improved water cycle were ranked 11th, indicating relatively lower perceived effectiveness among respondents. Other impacts of agroforestry practices such as income generation ranked 12th along with improved human health and well-being, while adaptive capacity ranked 14th.

Chi-square analysis

Table 4 presents the chi-square analysis of the relationship between respondents’ socioeconomic characteristics and the effectiveness of eco-friendly agroforestry practices in reducing climate change vulnerability. The results show that there is no significant relationship between most socioeconomic characteristics and the effectiveness of eco-friendly agroforestry practices, except for annual income, which was found to be significant, as indicated in the table. This suggests that the effectiveness of eco-friendly agroforestry practices in mitigating climate change vulnerability is generally independent of respondents’ socioeconomic characteristics. However, annual income appears to have a significant influence on the effectiveness of agroforestry practices in Osho Forest Reserve, Southwest Nigeria.

Table 4. Chi-square analysis of the relationship between the socioeconomic characteristics of respondents and the effectiveness of eco-friendly agroforestry practices

Tabela 4. Analiza testem chi-kwadrat zależności między cechami społeczno-ekonomicznymi respondentów a skutecznością ekologicznych praktyk agroleśnych

Variables	χ^2 -value	p-value	Decision
Sex	4.105	0.250	not significant
Age	4.486	0.877	not significant
Marital status	7.799	0.555	not significant
Annual income	23.979	0.020	significant
Years of experience	14.466	0.107	not significant

Note: p-value significant at $\alpha = 0.05$.

Source: field survey, 2025.

Notka: Wartość p istotna przy $\alpha = 0,05$.

Źródło: badania terenowe, 2025.

Table 5. Pearson product moment correlation between socioeconomic factors and the effectiveness of eco-friendly agroforestry practices

Tabela 5. Korelacja r-Pearsona między czynnikami społeczno-ekonomicznymi a skutecznością ekologicznych praktyk agroleśnych

Variables	r-value	p-value	Decision
Sex	0.287	0.284	not significant
Age	0.019	0.617	not significant
Income	0.277	0.005	significant
Marital Status	0.176	0.500	not significant
Years of Experience	0.146	0.040	significant

Source: field survey, 2025.

Źródło: badania terenowe, 2025.

Pearson product moment correlation

Table 5 presents the Pearson product moment correlation analysis of the relationship between socioeconomic factors and the effectiveness of eco-friendly agroforestry practices in reducing climate change vulnerability. The results indicate a positive and significant association between income and years of farming experience and the effectiveness of eco-friendly agroforestry practices, although the correlations are weak. This weak positive relationship suggests limited practical significance of respondents' socioeconomic characteristics in mitigating climate change vulnerability in Osho Forest Reserve. This finding is consistent with Dauda and Akomolafe (2023), who reported weak positive correlations between climate change vulnerability and adaptation strategies, with limited practical significance.

CONCLUSION

This study examined the utilization of eco-friendly agroforestry strategies in reducing climate change vulnerability among rural dwellers around the Osho Forest Reserve. The findings indicate that respondents were predominantly male, within the economically active age group, largely Christian, and with an average level of education. The results further demonstrate that key agroforestry practices – such as alley cropping, windbreaks, hedgerows, and live fences – are widely adopted in the study area. These practices were perceived to contribute to climate change mitigation

through multiple pathways, including soil conservation, carbon sequestration, reduced greenhouse gas emissions, and decreased reliance on fossil fuels. Additionally, they are associated with improved ecosystem functioning, reduced risk of crop failure, enhanced resilience to climate-related shocks, increased community cohesion, improved food security, biodiversity conservation, and improved water cycle regulation and climate stability. Although only half of the respondents (50.0%) perceived these strategies as effective in addressing climate change vulnerability, the range of identified benefits suggests growing awareness of their environmental and socioeconomic relevance. Overall, eco-friendly agroforestry practices represent a viable and sustainable approach to mitigating climate change vulnerability in the Osho Forest Reserve, Southwest Nigeria. Accordingly, the study recommends strengthening farmer training and capacity-building initiatives on climate-resilient agroforestry practices, establishing effective monitoring and evaluation frameworks to track the impacts of agroforestry practices on climate change vulnerability, and enhancing collaboration among stakeholders – including government agencies, NGOs, and local communities – to promote wider adoption and long-term sustainability of agroforestry practices.

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WPŁYW EKOLOGICZNYCH PRAKTYK AGROLEŚNYCH NA PODATNOŚĆ NA ZMIANY KLIMATU WŚRÓD MIESZKAŃCÓW OBSZARÓW WIEJSKICH W REZERWACIE LEŚNYM OSHO, POŁUDNIOWO-ZACHODNIA NIGERIA

ABSTRAKT

Spółeczności wiejskie, zwłaszcza te zależne od rolnictwa i zasobów leśnych, napotykać znaczące zagrożenia wynikające ze zmian klimatu. W badaniu poddano analizie wpływ ekologicznych praktyk agroleśnych na podatność na zmiany klimatu wśród mieszkańców obszarów wiejskich w rezerwacie leśnym Osho. Przy użyciu techniki losowania wielostopniowego wybrano 100 respondentów, a dane zebrane za pomocą kwestionariuszy i wywiadów przeanalizowano przy użyciu statystyki opisowej i indukcyjnej. Wyniki wykazały, że około 58% respondentów posiadało rodzinę liczącą 5 osób lub mniej, a 38% było w przedziale wiekowym od 31 do 40 lat. Wyniki pokazały również, że ok. 50% respondentów posiada ziemię z dziedziczenia, podczas gdy 38% respondentów osiąga roczny dochód powyżej 600 000 ₦ (413,35 USD). Ponadto ustalono, że większość respondentów była świadoma ekologicznych praktyk agroleśnych, takich jak uprawa współrzędna w pasach (*alley cropping*), pasy przeciwwietrzne, żywopłoty oraz rzędy grodzące. Co więcej, badanie wykazało skuteczność ekologicznych praktyk agroleśnych w łagodzeniu podatności na zmiany klimatu. Ochrona gleby odnotowała najwyższą średnią ocenę ($m = 2,18$), zajmując pierwsze miejsce; na drugim miejscu znalazła się sekwestracja węgla ($m = 1,98$), a na trzecim redukcja emisji gazów cieplarnianych ($m = 1,83$). Analiza testem chi-kwadrat wskazała, że większość cech społeczno-ekonomicznych respondentów: płeć ($p = 0,250$), wiek ($p = 0,877$) i stan cywilny ($p = 0,555$) nie była istotnie powiązana ze skutecznością ekologicznych praktyk agroleśnych. Jednakże roczny dochód ($p = 0,020$) wykazał statystycznie istotną zależność przy $p < 0,05$. Dalsza analiza z wykorzystaniem korelacji r-Pearsona ujawniła statystycznie istotny, ale słaby dodatni związek między cechami społeczno-ekonomicznymi a skutecznością ekologicznych praktyk agroleśnych w radzeniu sobie z podatnością na zmiany klimatu ($r = 0,277$; $p = 0,005$). Podejście to podkreśla potencjał ekologicznego agroleśnictwa w łagodzeniu zmian klimatu i utrzymaniu środków do życia na wsi, przy zaleceniu zwiększenia wsparcia poprzez praktyki odporne na klimat, budowanie potencjału, zaangażowanie społeczności oraz inicjatywy przywracania lasów.

Słowa kluczowe: adaptacja, agroleśnictwo, ekstremalne zjawiska pogodowe, społeczności wiejskie, źródła utrzymania, rezerwat leśny