FUDMA Journal of Sciences (FJS)
ISSN online: 2616-1370
ISSN print: 2645 - 2944
Vol. 10 No. 15, August, 2026, pp 75 – 85
DOI: https://doi.org/10.33003/fjs-2026-1015-5608

Climate Change Perception and Livelihood Disruptions Among Coastal Communities of Southwestern Nigeria

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Received: 27 July 2026
Accepted: 11 Aug. 2026
Published: 31 Aug. 2026

ABSTRACT
This study investigated the trend in fisher folk's perceptions of climatic variability relative to observed climate variation. Data on actual climatic variation over 30 years (1994-2024) was reviewed and compared with the fishers' sensitivity to climate change. The study examined 400 fisher folk in coastal communities in Lagos, Ogun, and Ondo states. The mean age of the respondents is 49.4 years, and their mean fishing experience is 24.7 years. The mean fishing income is 215,012 Naira. 66 percent of respondents across the study areas were educated up to the secondary school level. The respondents reported a high perception of climate change and there was an alignment between the respondents' perceptions of climate change and actual climate variations. The study reported a perceived decline in average fish catch, incessant changes in fishing areas, disrupted fishing operations, limited market access, and damage to fishing gear as direct impacts of climate change. In Lagos State, respondents reported the highest sensitivity to ocean surges, shoreline erosion, and windstorms; in Ondo State, to prolonged rainfall and ocean surges; and in Ogun State, to windstorms and rising surface air temperature. Overall, the findings show that the fisher folk accurately perceived critical climate change patterns. Socioeconomic variables, including age, education, fishing experience, fishing income, and social capital positively influenced fishers' perceptions of climate change patterns in the study areas.

Keywords: Climate Change, Vulnerability, Livelihood

INTRODUCTION

There is a strong need for incremental responses to address and reduce developmental deficits and poverty risks resulting from structural decline in resource-dependent economies negatively affected by climate change (Wannerwitz and Garschagen 2023). The major impact has been the continuous spread of rural poverty, as observed in other Sub-Saharan African countries, and Nigeria's rural communities are experiencing the intensity and higher frequency of these climatic shocks, which are drawing and locking rural households into poverty, especially small-scale farmers and artisanal fisher folk. (World Bank Report 2021, Omoyinmi *et al* 2023). Climate change has a pervasive effect, predisposing rural communities to poverty regardless of their agro-ecological zones or livelihoods. There is an empirical need to probe the differentials in responses and localized perceptions of climate change throughout diverse agro-ecological zones and livelihood activities within rural communities. And in the introspect Nigeria has a distinctive coastline, bubbling with artisanal fisher folk communities that are the crossroads of the different effects of climate change on the water bodies contiguous to their communities. In these coastal communities, numerous economic activities depend heavily on marine resources. Considering the fact of the importance of smallholder farming households in crop production system, the artisanal Fisher Folks are major players in the country's fishing sectors. Artisanal fishing has been considered an important contributor to the livelihoods and food security of low-income families in developing countries, where access to employment opportunities is limited. According to FAO (2024) and Odioko and Becer (2021), more than 74 percent of Nigeria's total domestic production is generated by artisanal small-scale fishers from coastal, inshore, creeks of the Niger Delta, lagoons, inland rivers, and lakes, while aquaculture and industrial fisheries contributed only 24.91% and 1% respectively of the total fish produced in 2018 and above.

In the context of the Nigerian livelihood system, artisanal fishing refers to small-scale, traditional fishing practices typically carried out with simple, often manual tools and techniques. (Zakariyah *et al* 2021). They operate in coastal regions and brackish inland waterways. They are limited in their operations by crude, traditional fishing technology that is generational and tied to their fishing peculiarities. Despite the importance of artisanal fishing to coastal communities, there is a need to examine the exigencies faced by artisanal fishermen, including pressures, shocks, and responses to climate change. These impacts are varied, resulting from rising sea temperatures, ocean surges, ocean acidification, violent windstorms, coastal and shoreline erosion, flooding, and other extreme weather events. While there had been research studies documenting the generic socio-economic issues, livelihood vulnerability, and disruption assessments, and other selected related issues among the artisanal fishers, (e.g, Okon *et al*, 2019; Franzier *et al* 2010; Tafida *et al* 2013) and that of Akingba *et al* (2017) and Ogunremi *et al* (2023), there still remain a significant gap in investigating the state-specific analyses and comparative assessment of climate change issues across Lagos, Ondo and Ogun states. A particular consideration is needed to be given to examining the inherent and latent mismatch between the fishers' perceptions of climate change in the context of observed changes in weather, atmospheric temperature, sea conditions and the fish availability. This latent information subsumed within this historical data are important factors to explicate the perceived livelihood impacts and disruptions due to climate change effects on the artisanal fishers, on how their

fishing practices, income stability and household resilience were altered over time, by the cumulative effects of climate change effects within their economic space.

The study therefore examined the artisanal fisher folk's perception of Climate Change and the attended Livelihood Disruptions within the Coastal Communities of Southwestern Nigeria. Specifically, the study examined the economic activities impacted by the climate change and socio-economic factors that influence the perception of climate change by the artisanal fisherfolk.

MATERIALS AND METHODS

Areas of Study

The study was carried out in coastal communities in South-West Nigeria. There are only three states with coastal lines in south-west Nigeria, Lagos, Ogun, and Ondo States. In Ondo state, Ilaje Local Government Area is the sole local government with a coastline. It has about 80 km of coastline (Ogunrayi *et al.* 2022). According to Babatunde (2010), 80% of the population of the Ilaje Local Government Area engages in fishing, and the area consistently accounts for the bulk of the fish produced in Ondo State. In Ogun State, the Ogun Waterside Local Government Area is the only area with a coastline. The local government area is a hub of fishing villages that are situated on creeks, lagoons, and the coastline at the southern end of Lagos Lagoon. Lagos State has 20 local government areas, of which 6 are Coastal.

The study used a multi-stage sampling procedure to get the respondents across the three states. The three states, Lagos, Ogun, and Ondo, were purposively selected because they are the only states with a coastline and coastal communities in the southwest of Nigeria. The coastal Local Government Areas were purposively selected for the study because they have functional fishing communities, are bordered by river tributaries flowing into the Atlantic Ocean, and are part of Nigeria's coastline. In Ondo State, the only local government area with coastal communities is Ilaje Local Government Area, which was purposively selected for the study. In Ogun state, the only government with a coastline is the Ijebu Waterside Local Government area, which was purposively selected for the study.

The Lagos state has Amuwo-Odofin, Epe, Ibeju-Lekki, Eti-Osa, and Badagry Local Government Areas that are contiguous to the marine water bodies. Two local government areas were selected using a proportionate sampling method to ensure respondents were representative of each area. Five active fishing communities were purposively selected for the studies, per the local government. The list of registered fisher folks with the local artisanal fishing groups was obtained, and 5 fisher folks were randomly selected per community. The total expected number of respondents was 100 per local government, for a total of 400 artisanal fishers in the studies.

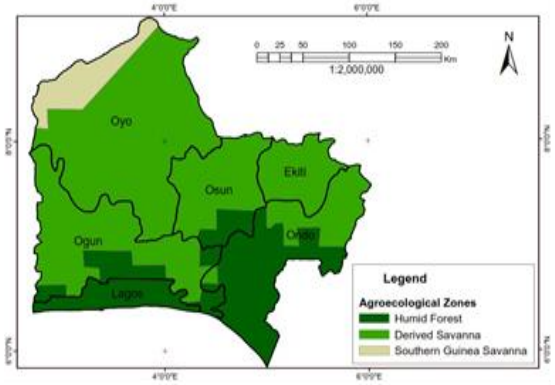

Figure 1: The Map of the Study Areas

Method of Data Collection

The data for the research study were collected from both primary and secondary sources. Primary data were collected through the administration of a carefully designed questionnaire to gather relevant socio-economic characteristics of the fisher folk, as well as data on the elements contributing to their vulnerability to climate change in the study areas. Secondary data were collected from information and data available from the European Centre for Medium-Range Weather Forecast, and the World Bank Climate Knowledge Repository. This data collection contains historical weather information on relative rainfall, sunshine, and humidity for the study areas. The questionnaire used a Likert scale designed to accommodate respondents' responses. The questionnaires provided engaging knowledge of perceptions of climate change, mitigation measures, socioeconomic characteristics, perceived livelihood impacts, and the effects of climate change. Secondary data on climate variations and changes were obtained from statutory agencies. The data were actual variations in temperature changes, annual rainfall, humidity, and flood frequency over the last 30 years (1994 to 2024).

Data Analysis

The analytical techniques used in the study included quantitative and qualitative methods, as appropriate. The data were processed and subjected to both descriptive and inferential statistics, as follows:

Descriptive Statistics

These consisted of frequency distributions, percentages, mode, and mean to describe the socio-economic characteristics of the respondents and to illustrate the broad patterns of their responses across the study areas.

Likert Rating Scale Analysis

This study used a Likert scale. The goal of the analysis was to examine artisanal fisher folk's perceptions of climate change. Each climate change perception statement item under review was assigned a score (on a scale from 1 to 5) for each of these criteria. The scores were then examined to obtain a final score, which helped prioritize items from most to least perceived.

Logistic Regression Model for Factors Influencing Respondents' Perception of Climate Change

To determine the factors affecting perceptions of climate change among artisanal fisher folks, a logistic regression model (also called a logit model) was used. The dependent variable is dichotomous in nature. The Artisanal Fishers' The model is stated as follows:

$$L\_n\ (P\_i/(1-P\_i\ ))= Y = \beta 0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + e \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where Pi (Dependent Variable) = perceived climate change level (high level perception= 1 and otherwise = 0).

Table 1: Factors Influencing Respondents' Perception of Climate Change

	Variables	Explanation
X_1	Age	In Years
X_2	Sex	Male = 1 female =0
X_3	Marital Status	married = 1, Otherwise=0
X_4	Total income from fishing	Value in Naira
X_5	Membership of social group	Membership=1, otherwise=0
X_6	Household size	In numbers
X_7	Year of Formal Education	Actual years of schooling
X_8	Fishing experience	Actual number of years
X_9	Extension contacts	Yes (1) otherwise (0)
e	Stochastic Error terms	

RESULTS AND DISCUSSION

The Socioeconomic Characteristics of the Respondents

Table 2 presents the age distribution of the respondents in the study. Respondents in Lagos state have the lowest mean, while those in Ogun state have the highest. This evidence supports the submission of Mohammed et al (2023) that the average age of the artisanal fisher in Nigeria is within the age bracket of 45 to 50 years. These outcomes show that artisanal fishing in coastal areas has become a budding source of livelihood opportunities for the male population of the community, who are in the active age group and can support more strenuous economic activities. The table further shows that all respondents are male. Artisanal fishing is an economic activity that demands physical strength and entails intrinsic dangers, which can be a concern for women in the communities. This evidence supports the submission of Adelaja *et al* (2020) that artisanal fishing is exclusively male-dominated, while women engage in processing and marketing. Cultural perspectives additionally reinforce male dominance in fishing activities. (Adeleke and Fagbenro 2021).

The mean household size is 5 across the study areas. The largest percentage (84%) of respondents have households with 5 to 8 members. This is in consonance with the submission of Oyerinde and Jacobs (2022), who found that the average household size in South Western Nigeria was 5. The average house size across the study areas indicates that family size is neither large enough to impose an economic burden on the household head and provides a substantial source of family labour for fishing operations. The average family size of 5 to 8 members across the study areas might indicate urban migration driven by generational shifts and ample livelihood opportunities for economic integration. (Omoroghomwan *et al* 2023). Table 2 shows the appreciable literacy level across the study areas, with the majority (71.50%) in Lagos State, 64% in Ondo State, and 79% in Ogun having formal education beyond primary school. The implication is that the artisanal fishers in the study areas will be made aware of climate change information and mitigation measures that support their economic well-being amid challenges to their livelihoods. The pooled data show that 66.5% of respondents have both secondary and tertiary education, raising the chances of adopting climate-smart fishing and mitigation strategies to address the hazards associated with climate change. The results support the work of Priatna and Khanl (2024), who pointed out the importance of formal education in the adoption of mitigation measures against the effects of climate change and how formal education exposure influences the choices of people to respond favorably to actions that address their understanding of the impact of climate change on their livelihood and how to reduce their direct impacts.

The distribution of respondents by fishing experience shows that the average across the study areas is 24.7 years. This is in tandem with the report by Siyanbola *et al* (2021), which reported the average fishing age of coastal fishers in coastal communities' ranges from 22.2 to 24 years. Lagos State has the lowest mean, and Ogun State has the highest. The years of experience are critical to the economic decisions made by the fishers during their operations and subsequent demands. The results emphasize that the average year of fishing experience across the study areas reflects the involvement of both younger and experienced individuals in artisanal fishing operations in south-western coastal communities. Cumulatively, 76.5% of the respondents have between 24 and 46 years of fishing experience across the study areas, which implies that there is a possibility that the respondents are exposed to indigenous and improvised mechanisms of gathering weather information and understanding the adverse effects of any visible changes in the weather pattern on their fishing operations. Table 2 shows that the mean monthly income from the fishing operation was 215,021 Naira across the study areas. Ondo State has the highest mean monthly income, followed by Ogun State, and Lagos State has the lowest. The majority of the respondents (39.50%) in Lagos State made between 150,000 and 200,000, the same as in Ogun State, with the majority of the respondents (31.50%) in the income bracket. But the majority, 24% of the respondents in Ondo state, made between 250,000 and 300,000, compared to other sampled states. Ondo state also shows stronger fishing income, with 12% of respondents earning between 400,000 and 750,000 per month. In general, income from the fishing operation tends to be insufficient for the economic well-being of the fishers, with the dollar equivalent (1,400 naira to 1 dollar) of the mean income being 153.59 dollars per month and 7.68 dollars per day. This result falls within the range of global mean monthly income among artisanal fishers, which is 110.10 dollars (Teh *et al.,* 2023). The income represents poor income generation among the majority of the fishers across the study areas. The effect lies in the fact that the fishers' livelihoods in coastal communities are easily vulnerable to economic stress from slight climate variation, leading to a negative impact on their economic well-being and

causing them to diversify their income sources to sustain their livelihoods.

Table 2 presents non-fishing income among those who diversified their livelihoods. The average monthly non-fishing income was 73,000 Naira across the study areas. Ondo state respondents had the highest non-fishing income, and Lagos state respondents had the lowest. The monthly non-fishing income from the study areas is low, and this could pose critical economic problems for the fishers if their primary livelihood, that is, fishing, is halted due to climate change impacts. According to Oyetade *et al* (2025), the communities generally engage in tother livelihood activities to augment the resources and income derived from their primary occupation. It is a common trend among the people who are capable and willing to access the livelihood opportunities available to them. The results from Table 2 show that 86% of the respondents have access to credit in different forms. Access to credit, according to Fadeyi *et al* (2022), plays a key role in the growth and expansion of adoption and diverse livelihood activities among rural dwellers. In Table 2, 86. % of respondents reported that cooperative societies are the main source of credit for their livelihood activities, and 14% reported that official financial institutions are the main source of credit. The results suggest the need to examine factors that predispose artisanal fishers in coastal communities to low patronage of organized formal financial institutions for credit services.

Table 2: Socioeconomic Indices of the Respondents

Variable / Category	Lagos State		Ondo State		Ogun State		Pooled / Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Age Distribution								
≤40 years	37	18.50	11	11.0	16	16.0	64	13.5
41–50 years	83	41.50	37	37.0	33	33.0	153	38.25
51–59 years	73	35.50	47	47.0	36	36.0	156	44.0
≥60: years	7	3.5	5	5.0	15	15.0	27	6.75
Total	200	100.0	100	100.0	100	100.0	400	100
Mean	48		49.8		50.33	48	49.4	
Standard Deviation.	7.48		7.1		8.58	7.48		
Gender								
Male	100	100.0	100	100.0	100	100.0		
Female	0	0	0	0	0	0		
Total	200	100.0	100	100.0	100	100.0		
Marital Status								
Household Size								
1 – 4	38	19.0	9	93.0	14	14.0	61	15.25
5 – 8	160	80.0	90	2.0	86	86.0	336	84.00
9 -- 12	2	1.0	1	5.0	0	0.0	3	0.75
Total	200	100.0	100	100.0	100	100.0	400	100
Mean	5		5		5		5	
Standard Dev.	1.00		1.05		0.81		1.01	
Educational Level								
No formal Education	0	0.0	1	1.0	0	0.0	1	0.25
Adult Education	0	0.0	5	5.0	0	0.0	5	1.25
Primary Education	57	28.5	30	30.0	21	21.0	108	27.00
Secondary Education	136	68.0	59	59.0	78	78.0	263	63.25
Tertiary Education	7	3.5	5	5.0	1	1.0	13	3.25
Fish Experience								
Less than 10 years	15	7.5	8	08.0	6	06.0	29	9.75
11 – 20	52	26.0	20	20.0	22	22.0	94	23.50
21 -- 30	97	48.5	49	49.0	44	44.0	189	47.50
31 -- 40	31	15.5	19	19.0	26	26.0	74	18.50
41 and Above	5	2.5	4	04.0	2	04.0	11	2.75
Total	200	100	100	100	100	100	400	
mean	23.10		24.4		24.7		24.7	
Standard Dev.	8.27		8.7		8.21		8.37	
Minimum	7		7		2		2	

Variable / Category	Lagos State		Ondo State		Ogun State		Pooled / Total	
	Frequency	**Percentage**	**Frequency**	**Percentage**	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Maximum	42		45		46		46	
Monthly Fishing Income (Naira)								
≤200000	79	39.50	11	11.0	36	36.0	126	31.50
201000-250000	47	23.50	19	19.00	30	30.0	96	24.00
251000-300000	11	5.50	24	24.00	8	08.0	43	10.75
301000-400000	0	0.00	27	16.00	0	0.0	16	4.00
≥401000	0.	0.00	12	12.00			12	3.00
Total	200	100.0	100	100	100	100.0	400	100
Mean	174,607		287,000		183,456		215,021	
Standard Dev.	48,633		110,625		47,239		68,840.	
Monthly Non-Fishing Income								
Less than 50,000	80	40,00	33	33.0	15	15.0	128	32.0
51,000 -- 100,000	120	60.00	22	22.0	81	81.0	223	55.75
101,000 – 150,000	0	0.00	33	33.0	4	04.0	37	9.25
151,000 – 200,000	0	00.0	12	12.0	0	00.0	12	3.00
Total	200	100	100	100	100	100	400	100
Means	56,435		86,495		76,070		73,000	
Standard Deviation	11,707		55,029		18,235		85,981	
Access to Credit								
Cooperative societies	182	91.0	86	44.0	76	75.00	344	86.00
Formal Financial institutions	18	9.0	14	56.0	24	25.00	56	14.00
Total	200	100.0	100	100.0	100		400	100

Source: Computed from Field Survey, 2025

Economic Shocks and Activities Impacted by Climate Change Effects

Table 3 shows the distribution of prevalent economic shocks across the study areas. 10 indicators were analyzed to describe the livelihood shocks resulting from climate change across the study areas. The respondents in Lagos State ranked Market Operation disruption with a score of 559 as the number one livelihood economic shock in the study areas. Climate-related disruptions (floods, supply chain disruptions) were most likely to have impacted and limited fishers' households' ability to sell fish and other products due to a lack of market access. The urban-coastal setup of Lagos State, due to high urbanization, may expose the study areas to flooded roads, degraded landing sites, and a dysfunctional transportation system within densely populated areas. (Koko and Bello 2023) The Fish Processing and Storage was ranked number two. Climate change-induced incidents such as floods, ocean surges, and shoreline erosion affect post-fishing operations, and changing ocean temperatures and related hazards can compound or trigger fish spoilage. The price volatility score was 553, ranking it the third economic shocks across the study areas. Fishers face challenging price fluctuations due to the direct effects of climate change, particularly prolonged rain, flooding, and windstorms, which affect their income stability. The Declining Fishing Operation due to Frequent storms over the last five years, as observed by the Fishers, ranked 4th. The raging windstorms and other hazards affect the weekly fishing operation. A reduced fishing period due to frequent adverse weather will ultimately reduce the catch. The Salinity intrusion and reduced freshwater availability are likely to increase the time and cost of sourcing clean water for household use and processing fish. The respondent ranked these livelihood shocks as number 5. The labour redundancy (score 440, ranked 6) was considered by respondents to be a moderate, low-impact indicator of economic shocks. The impact of the reduced fishing period is labour redundancy among the fishers. This becomes a source of economic shocks, especially among the fishers who do not diversify their income sources. This situation can prompt employment vulnerability, though not to an extreme degree. The household feeding pattern ranked 7th. The Lagos state study areas clearly show a moderate disruption in household food patterns. Livestock production in the study areas was considered moderately affected by climate change. The loss of livestock ranked 8th; the combined effects of climate change have little impact on household livestock. Communal Conflict and capital flight were ranked number 9. The respondents reported near-absence of communal conflict and the sale of assets to cope with the loss of livelihood. The most major economic

shocks in the Lagos state study areas were ranked from 1 to 5. Therefore, common economic shocks include market disruptions, price volatility in the fish operation, dysfunctional fish processing, and health and sanitation challenges. In the Ondo and Ogun state study areas, Climate-related disruptions (e.g., floods, supply chain breaks), household sanitation, health, and Labour Redundancy were ranked number 1 with a score of 300 in Ondo state, while fishing operations were ranked the number 1 source of economic shocks. These were considered severe and major economic shocks in the study areas. Price Volatility, with a score of 290, ranked fourth in Ondo state and fifth in Ogun state. Climate-induced hazards (flooding, irregular rainfall) can predispose price fluctuations when a climate event interrupts the fishing period. The respondents ranked the fishing operation and fish processing and storage 5th in Ondo state, but were ranked 3rd in by the respondents in Ogun state. The decline in fish catch and processing, which can be affected by prolonged warmth, can accelerate fish deterioration and breakdown. Household feeding pattern, the disruption in households' food patterns due to the fallout of climate change, was ranked 7th by respondents in Ondo and Ogun states. Post-harvest losses due to erratic weather can disrupt the drying and smoking processes, additionally decreasing the amount of processed fish that reaches households' tables. The demand for fish due to low catch rates may cause artisanal fishers to sell to markets rather than consume it at home. Respondents in Ondo and Ogun states did not consider livestock losses, communal conflict, or capital flight as economic shocks. Based on the ranking, it can be deduced that the following indicators: market operations, household sanitation and health, labour redundancy, price volatility, and fishing operation were considered as major economic shocks in the Ondo state study areas, and declining fishing operations, household sanitation, fish processing and storage market operation, and price volatility were considered as major economic shocks in Ogun state. These results corroborate the findings of Joshua *et al* (2023) that climate change events may subject households to economic shocks, negatively affecting their livelihood incomes. Iwayemi *et al.* (2025), in their research among coastal communities in Ondo State, reported the devastating impact of climate change events on the economic well-being of fishing households, whose homes and fishing gear were damaged by ocean surges and shoreline erosion. These submissions reinforce the negative effects climate change events have on the communities at the direct precipice of the ravaging impacts of the extreme weather variations.

Table 3: Distribution of Economic Shocks and Activities Impacted by Climate Change Effects Among the Respondents

INDICATORS	Lagos (n=200)		Ondo (n=100)		Ogun (n= 100)	
	Scores	Ranking	scores	Ranking	scores	Ranking
Market operation:	559	1	300	1	278	4
Fish processing and storage:	553	2	289	5	279	3
Price volatility:	552	3	290	4	270	5
Fishing operation:	545	4	289	5	281	1
Household sanitation and health:	523	5	300	1	280	2
Labour redundancy:	440	6	300	1	232	6
Household feeding pattern:	406	7	288	7	207	7
Loss of livestock:	210	8	200	8	109	9
Communal conflict:	200	9	200	9	100	10
Capital flight	200	9	9	9	100	10

Source: Computed from Field Survey, 2025

The Artisanal Fisher Folks' Perception of Climate Change with Actual Variations in the Study Areas

The results of the Climate Change Trend and Risk Perception of the respondents are presented in Table 4. The table presents the calculated scores and index values for each climatic event. From the tables the CCRPS was calculated on the 11 climatic events with the score ranging from 146 to 570 for the Lagos state respondents, (lowest value 0 to highest value 660), CCRPS of 54 to 277 for Ogun State respondents (lowest value 0 to highest value 330), and for CCRPS of 18 to 239 for Ondo State (lowest value 0 to highest value 330). This study adopted the stratification of respondents into levels of climate change sensitivity by Ahmed *et al.* (2021) to categorize respondents into three levels across the study areas. These levels are Low, Medium, and High Sensitivity. After studying the range of the CCRPS value, the results show that Lagos State respondents were sensitive to the risk of climate change at the medium level, with eight out of eleven climate change events, were sensitive at the low level to one climate change event, and were sensitive to three climate change events at the high level. For Ondo State, the respondents were sensitive to the risk of climate change: low in one climate change event, medium in eight, and high in two. In Ogun State, the respondents reported low sensitivity to two climate change events, medium sensitivity to seven, and high sensitivity to two. The least perceived, yet most critical, climate change risk was rising sea water temperatures. The respondents' perception of rising sea temperatures may be due to a lack of technical resources and marine data to raise awareness and knowledge of sea surface temperatures in the study area. To strengthen the robustness of climate change risk perception, the CCRPI was standardized to produce composite scores. According to the Standardized Climate Change Risk Perception Index (SCCRPI), respondents in Lagos State coastal communities identified frequent ocean surges and shoreline erosion, frequent hazardous windstorms, prolonged rainfall, and gully and land erosion as the major climate change events presenting risks. In Ondo State, frequent ocean surges and shoreline erosion, frequent hazardous windstorms, Irregular and delayed rainfall, and frequent floods were perceived as major climate change events and sources of risk. Respondents in Ogun State identified frequent ocean surges and shoreline erosion, frequent hazardous windstorms, and surface air temperature as major climate change events presenting risks. Generally, respondents across the study areas have a moderate perception of climate change. Having a high perception means the vulnerable populace can decide how mitigation measures are developed and adopted to address the inherent hazards that can alter their livelihood activities, resulting in lower well-being. A moderate level of

perception will increase the populace's vulnerability. From the results, the coastal artisanal fisher folk are vulnerable to the risks inherent in climate change events, with frequent ocean surges, erosion, and irregular rainfall affecting the livelihood of the respondents. Similar results were found in other research works. (Opele *et al* 2022).

Table 4: Distribution of Climate Change Trend and Risk Perception of the Respondents

Climate Change Event	Lagos SCCRPS (%)	Ondo SCCRPS (%)	Ogun SCCRPS (%)	Overall Trend & Consensus Ranking
Ocean surge and shore erosion	95	79	71.7	1st (top-ranked in all states)
Frequent windstorm	94	70	65.7	2nd
Prolonged rainfall	69.2	92	54.3	High variability; top in Ondo
Irregular Rainfall	76.7	69	65.7	Consistently medium-high
Land surface erosion	68.3	60	62.7	Medium across states
Frequent flood	65.3	42	65.4	Medium (lower in Ondo)
Surface Air Temperature	60.7	63	57.3	Medium-low
Prolonged dryness	60.7	50	36	Low
Climate change induced sickness	40.8	55	38.1	Low
Water Contamination	41.2	10	60	Low (very low in Ondo)
Rising Sea temperature	24.3	18	5.4	Lowest ranked in all states

Source: Computed from Field Survey, 2025

The 30 Years Period Actual Variation in Surface Air Temperature Pattern in the Study Areas. (1994 to 2024)

Temperature Trends

Annual mean temperatures in Lagos, Ogun, and Ondo states show a clear increase in the trend over the 30-year period. The temperature across the three states exhibited a distinct long-term rise over the 30-year period. The mean temperature fluctuated between 29.5 and 30.5 degrees Celsius between 1994 and 1999 and between 31.5 and 32.5 degrees Celsius between 2023 and 2024, representing an average increase of 1.5 to 2.5 degrees Celsius. The highest recorded temperature was in Ogun State and was consistent over time. Ondo state recorded the second-highest average temperature. Lagos State recorded the lowest average temperature, which can be plausibly due to the moderating effect of the direct inflow of coastal breeze throughout the year according to the report of Peng *et al* (2021), that sea breeze influences the environment contiguous to the sea. The findings of this study show that surface air warmed consistently over the 10-year period across the three states under investigation. Respondents across the three states show sensitivity to changes in surface air temperature, perceiving the actual variation in the pattern, which is corroborated by average temperature changes over a 30-year period.

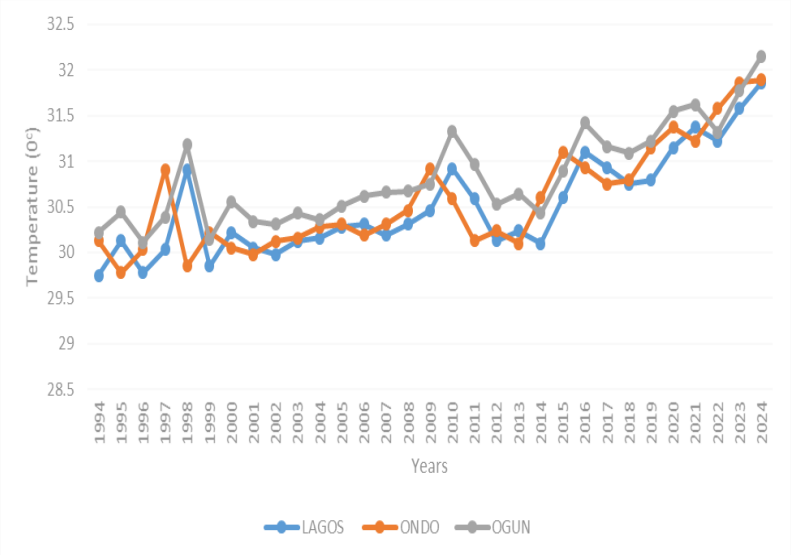

Figure 2: Annual mean Temperature (Lagos, Ondo and Ogun states) 1994---2024

Rainfall Patterns

The figure shows the annual average rainfall across the three states, with variations but no strong linear trend or consistent increase or decrease. The mean rainfall values range between 1,200 and 2,200 mm. Ondo state recorded the highest total fall, followed by Lagos state. Ogun state had the driest record of the three states. The period between 2000 and 2005 was drier, and the periods between 2018 and 2020 and 2023 to 2024 recorded the lowest rainfall during the period (1999—2024) under investigation. The actual variation in rainfall patterns supports the respondents' views across the study areas. They were moderately sensitive to the increase in rainfall over the period.

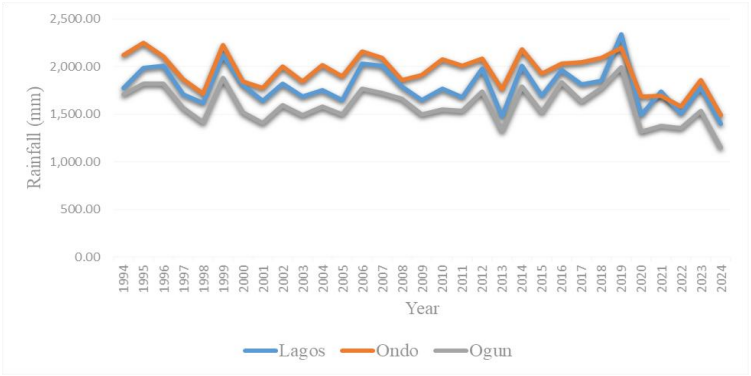

Figure 3: Annual Mean Rainfall (Lagos, Ondo and Ogun states) 1994---2024

Consecutive Dry Days

The number of the days without rainfall or consecutive dry day displayed year-to-year variation and no visible uniform long term trend across the three states. Ondo and Ogun states experienced consecutive dry days between 10 to 40 days. Lagos state mostly experienced fewer consecutive dry days compared to Ondo and Ogun States. The trend continued between 2020 to 2024, where there was high variation in the number of consecutive dry days without any clear sign of amplification. The respondents across the three states were moderately sensitive to the prolonged dryness based on their perceptions of the changes in climate pattern in the study areas.

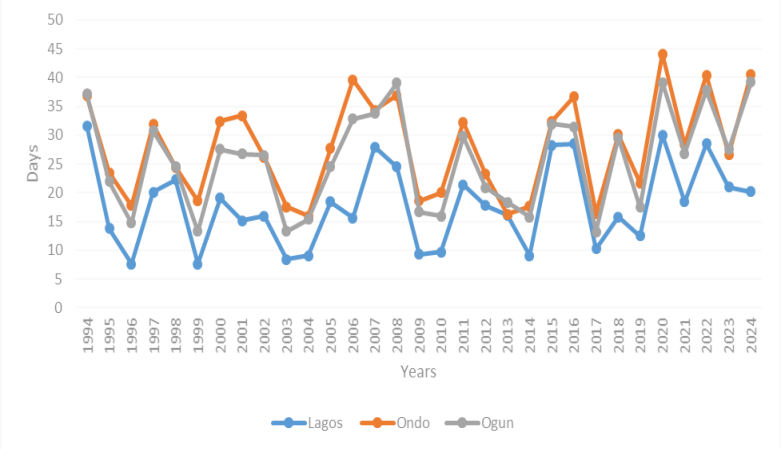

Figure 4: Annual Mean Consecutive Dry Days (Lagos, Ondo and Ogun States) 1994---2024

Surface Sea Temperature (SST)

The decadal variation in the surface sea temperature (SST), fluctuated between 26.5 to 29.5 degree Celsius with notable low record around 2000 and 2008 and with higher values in the early 1990 and 2018. The period between 2015 to 2024 shows a return to a warmer sea conditions. The respondents across the study areas show low perception of sea surface temperature. It cannot be stated explicitly if, the sea surface temperature actually affected the fish catch in the study areas.

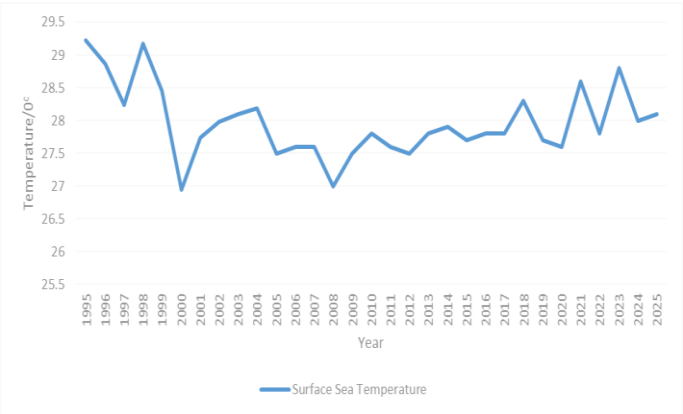

Figure 4: The Average Surface Sea Temperature (SST), 1994 – 2025
Sources: NOAA NCDC: National Climatic Data Center, COPERNICUS Marine Services

Wind Speed

Figure 5 shows the trend in the average wind speed over 30 years. Lagos State recorded the highest wind speed across the study areas, while Ondo State recorded the lowest. The average increase in wind speed between 2014 and 2024 was 0.17 meters/second in Lagos State, 0.020 in Ogun State, and 0.021 in Ondo State. The historical data show that over 30 years, apart from spikes and occasional storms, wind speed variation was not erratic, with an increase in wind speed observed beginning in 2024 across the three states. Respondents across the study areas were highly sensitive to wind movements. This can be ascribed to coastal communities situated in the direct path of the Atlantic Ocean winds. The driving force of ocean winds often generates waves that can trigger ocean surges, predisposing the shoreline, communities, land, and houses to coastal erosion. This is corroborated by Folorunsho *et al* (2023) in their study on the salient issues of coastal hazards and disasters in Nigeria, where they reported coastal flooding due to surging ocean winds. The variations, however minimal, support the respondents' perception of an increase in the wind speed in the study areas.

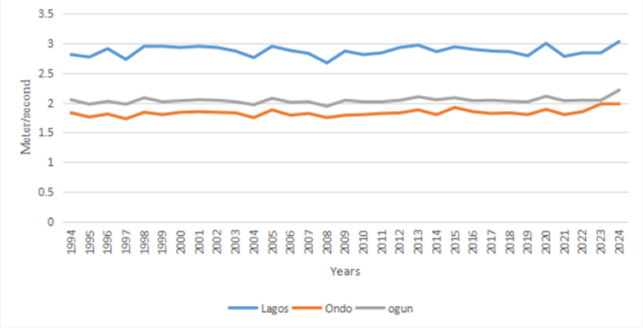

Figure 5: Annual Mean Wind Speed (Lagos, Ondo and Ogun states) 1994--2024

In the overall, the actual climate variation data indicated an ongoing surface warming across the states, indicating that the south west Nigeria is heating up. This is consistent with global trend in the climate change. The data shows relatively stable rainfall attended with high variations in the rainfall regime. The coastal climate system influenced the general climate over the coastal communities, with moderate temperature and elevated humidity. The combination of rising temperature, variation in rainfall and dry spells suggested the changing pattern of the climate and the stress the climate change is mounting on the productive capacities of the communities who are at the precipice of the effects of the climate change.

Social-Economics Factors Influencing the Perception of Climate Change across the Study Areas

The results from table 5 shows the significant relationship between perception of climate change and the age of the respondents across the study areas of Ogun state at 5% significant level. This implies that a unit increase in the age of the fishers will correspond to 2.4% increase in the odd that the fishers in the study areas will be sensitive to climate change effects in their communities. The age of the respondents does not have significant effects on the sensitivity of the fishers to climate change both in Ondo and Ogun States, these findings from Ondo and Ogun states are in variance to the submission Opele *et al* (2022), that age plays a critical role in climate change issues among the artisanal fishers in the coastal communities of south west Nigeria. The year of formal education was significant with the perception of climate change effects at 5% significant level across the study areas. A unit increase in the year of formal education will increase the odd that the artisanal fishers will be sensitive to the climate change effects. This finding corroborates the empirical submission of Adeboa and Anang (2024), that year of formal education is a key factor in climate change perception and the connection it has with rural livelihoods activities. The fishing experience was significant the respondents' climate change perception at 1% in Ogun state and at 10% in Ondo state, while it has no significant relationship with the respondents' perception in Lagos state. Ayisi *et al* (2024), in their studies, support this finding, they found out that fishing experience shapes awareness of climate change. The income derived from artisanal fishing is significantly related to the perception of climate change by the fishers in Ondo and Ogun states. A unit increase in the income derived from fishing will increase the odd of the artisanal fishers' sensitivity to climate change effects in the two states but not in Lagos state. Income is a principal factor in the economic and livelihood wellbeing of the fishers. A unit drop in the income derived from fishing as a primary source of livelihood will possibly jostle the artisanal fishers to seek for explanation for the negative change in their income. Social Group membership like artisanal fishers belonging to cooperative was found to be significantly correlated to climate change issues among the artisanal fishers in Anambra state (Ayisi *et al* 2024) and this support the finding of this study that shows that social group membership significantly related to climate change perception across the three states at 5% significant level. A unit increase in the membership of social group will increase the odd of artisanal fishers' sensitivity to climate change. A plausible explanation lies in the information sharing among and within group members which can increase awareness about the changing trend in climate patterns across the study areas. The findings from this study is in consonance with the submission of Effiong and Akwo (2026) that, the socio-economic factors like age, educational level and income have substantial influence that tend to alter activities around climate change issues within some specific communities.

Table 5: Logistic Regression Analysis of Factors Influencing Climate Change Perception

Variable	Ogun			Ondo			Lagos		
	B	S.E.	Sig.	B	S.E.	Sig.	B	S.E.	Sig.
Constant	-5.98	0.29	0.004	2.57	5.18	0.61	5.92	1.09	0.99
Age (years)	0.02	0.01	0.003**	-0.04	0.10	0.67	0.14	0.09	0.12
Sex	-0.06	0.27	0.54	18.0	1.33	0.99	0.64	0.81	0.42
Education	0.31	0.02	0.004**	0.34	0.71	0.03**	3.83	1.45	0.00**
Marital status	-0.09	0.66	0.81	18.9	1.59	0.99	0.00	0.01	0.06
Fishing experience	0.06	0.01	0.015***	0. 02	0.08	0.01*	0.10	0.08	0.27
Household size	0.06	0.06	0.60	0.30	0.57	0.001	0.02	0.09	0.82
Fishing Income	0.01	0.01	0.031*	0.01	1.00	0.03*	0.23	0.53	0.66
Social group membership	1.14	0.16	0.043**	0.89	1.24	0.005**	1.87	0.43	0.00**
Pseudo R	0.21			0.26			0.21		
R^2	0.120			0.18			0.14		

Sources: Field Survey Computation 2025. *, ** and *** for 10%, 5% and 1% Significant Levels

CONCLUSION

The study presented veritable facts about how the artisanal fisher folk are sensitive to the climate change pattern within their coastal communities and comparing their perception to actual variation in climatic data over the last thirty years. There was a moderate sensitivity to climate change effects across the three states. The silent but critical climate change effects that remained hidden to the artisanal fishers is the rising surface sea temperature, which directly impact the sea population. The perception of climate change effects was found to be aided more by the year of formal education and membership of social groups. It is therefore imperative to create more incentives to aid the fishers to belong to social groups or societies that are exposed to climate change information. The economic shock waves as a result climate change have differentials responses across the study areas. In Lagos state, climate change hazards resulted in disruption in market operation by affecting supply chain, isolating the fishers from market. The economic shockwaves in Ondo and Ogun states directly affected the act of fishing operations resulting in labour redundancy and health related issues. The three states ranked frequent ocean surge, shore erosion, hazardous windstorms and prolonged erratic as the first three physical climate hazards across the study areas. It is therefore imperative to funnel climate data concerning the sea temperature and marine forecast to the coastal communities through the activities of a designated state-wide extension services. The states should evolve policy on extension services that are designated towards coastal communities. The state governments should leverage existing fishing cooperatives groups as primary distribution channels of climate change information, education and early warning to the artisanal fishers. There should be a format to integrate the artisanal local knowledge of climate change perception into scientific holistic approach in managing the effects climate change and develop adaptation strategies to mitigate the impacts.

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