the Niger Delta has been shown to directly influence catch volumes (Idogho et al., 2022a). In Ilaje, 86.8% of respondents noted that changes in river flow affect fish availability, and 85.7% observed significant declines, reflecting broader challenges of reduced rainfall, climate variability, and human activities.

Table 7 Decadal minimum temperatures for Ilaje LGA

Year	Decade 1 (1996-2005)	Decade 2 (2006-2015)	Decade 3 (2016-2025)
1	20°C	20°C	21°C
2	20°C	20°C	20°C
3	20°C	20°C	23°C
4	19°C	19°C	21°C
5	19°C	19°C	21°C
6	20°C	19°C	20°C
7	19°C	19°C	21°C
8	20°C	21°C	22°C
9	19°C	21°C	22°C
10	20°C	21°C	22°C
Mean	19.6°C	19.9°C	21.3°C

Source: Nigerian Meteorological Agency (NiMet), 2025

Similar disruptions have been reported in southeastern Nigeria (Nnaji and Nzeadibe, 2023). Conversely, intensified rainfall in West Africa replenished wetlands but increased flooding risks (Ragatoa et al., 2020). Globally, reduced flows and blocked migration routes have contributed to an 81% decline in migratory freshwater fish populations (World Fish Migration Foundation, 2024). Cohen et al. (2016) further demonstrated that climate-driven hydrological changes in Lake Tanganyika reduced nutrient cycling and fish productivity. Overall, Ilaje's findings highlight that declining water levels threaten fisheries and livelihoods, requiring improved water management, climate adaptation, and ecosystem conservation.

Table 8 Effects of water level on fish catch volume in Ilaje coastal waters

Question	Agree	%	Disagree	%
High water level increases fish output	276	98.6%	4	1.4%
Low water level decreases fish output	273	97.5%	7	2.5%
Change in river flow affects fish availability	243	86.8%	37	13.2%
River water flow has considerably decreased	240	85.7%	40	14.3%
Total Respondents	280	100%		

Source: Nigerian Meteorological Agency (NiMet), 2025

3.9 Decadal variation of climatic variables: Rainfall (1996-2025)

Table 4 highlights rainfall and temperature trends in Ilaje LGA between 1996 and 2025, revealing significant climatic variability. The rainy season typically begins in late March or early April and ends by mid-October, but its duration has shortened from 218 days in 1996 to 182 days projected in 2025. This contraction reflects broader climatic shifts across Nigeria, where rainfall patterns have become increasingly erratic due to climate change (World Bank Climate Portal, 2024). Ishaku et al. (2024) similarly emphasized West Africa's rainfall sensitivity to oceanic and atmospheric circulation changes, leading to alternating wet and dry years. Annual rainfall fluctuates widely, ranging from 1,700 mm in 2015 to 2,200 mm in 2004 and 2019, with deviations exceeding ±10%. Sharp declines in 2006 (−11.0%) and 2015 (−12.1%) highlight risks for agriculture and water resources in coastal areas.