

3.5 Decadal maximum temperature trends (1996-2025)

Table 5 presents rainfall data across three decades in Ilaje Local Government Area (LGA), revealing variability alongside a long-term upward trend. The first decade (1996-2005) averaged 929.2 mm, with fluctuations from 503 mm to over 1,300 mm. Such irregular distribution likely constrained water availability and disrupted fish breeding cycles, consistent with findings in southern Nigeria where declining rainfall reduced river discharge and agricultural yields (Edokpa, 2020). In contrast, Adetayo (2021) reported relatively stable rainfall onset and cessation in southwestern Nigeria, suggesting localized climatic dynamics in Ilaje. The second decade (2006-2015) showed a 15% increase to 1,072.6 mm, with exceptionally high years such as 2004 (1,451 mm) and 2005 (1,509 mm). While higher rainfall replenished rivers and wetlands, excessive precipitation heightened flooding and erosion risks, as observed in the Niger Delta (Idogho et al., 2022b) and across West Africa (Ragatoa et al., 2020).

Projections for 2016-2025 indicate continued increases to 1,158 mm, consistent with national anomalies linked to atmospheric circulation shifts (Akinsanola and Ogunjobi, 2020). Variability ranging from 990 mm to 1,400 mm underscores instability. Similar climate-driven hydrological changes in Lake Tanganyika disrupted nutrient cycling and reduced fish productivity (Cohen et al., 2016). Overall, Ilaje's rainfall dynamics reflect regional climate trends, highlighting the need for adaptive water management, flood control, and resilient livelihood strategies.

Table 4 Decadal average rainfall

Decade	Period	Decadal Rainfall (mm)	Trend Observation
Decade 1	1996-2005	929.2	Slight Decrease compared to the previous decade.
Decade 2	2006-2015	1072.6	Significant Increase (about 15.4% increase from the 1996-2005 decade).
Decade 3	2016-2025 (Modeled)	1158.0	Continued Increase (Based on projected trends of increasing rainfall intensity and duration in the region).

Source: Nigerian Meteorological Agency (NiMet), 2025

Table 5 Tabular presentation of decadal rainfall (mm)

Year Index	1996-2005 (Decade 1) Rainfall (mm)	2006-2015 (Decade 2) Rainfall (mm)	2016-2025 (Decade 3) Modeled Rainfall (mm)
1	1149	966	1050
2	633	1127	1280
3	1110	1133	1100
4	503	1451	1350
5	811	1509	1400
6	1307	840	1020
7	819	1119	990
8	989	733	1180
9	866	992	1070
10	1105	856	1140
MEAN	929.2	1072.6	1158.0

Source: Nigerian Meteorological Agency (NiMet), 2025

3.6 Decadal minimum temperature trends (1996-2025)

Table 6 presents decadal maximum temperatures in Ilaje coastal waters, showing gradual warming and variability across three decades. The first decade (1996-2005) recorded a mean maximum of 32.6°C, ranging between 32°C -33°C, reflecting relatively stable thermal conditions. Similar modest warming was observed in southern Nigeria