

by Igejongbo (2020) and Omitoyin et al. (2021). The area has both freshwater and brackish water ecosystems, which allow for different kinds of fishing activities. The climate changes between wet and dry seasons, and rainfall impacts how much fish is caught. Ilaje has different fishing villages, each with its own culture and environment. For this study, ten major fishing villages along the Ilaje coast were picked: Ayetoro, Idiogba, Bijimi, Asumogha, Zion-Pepe, Ugbo-Nla, Ilepete, Awoye, Molutehin, and Ayila.

2.2 Study population and sampling procedure

The people in the study area were fishermen living in Ayetoro, Idiogba, Bijimi, and Asumogha. Estimates of the fishing population were gathered during early trips to the area and by talking with local leaders and fishing groups in 2025. These four villages were picked randomly using a lottery method to reduce bias and make sure they represented the larger fishing population. Data were gathered using questionnaires and interviews, similar to methods used in fisheries research in the Niger Delta (Omitoyin et al., 2021a). The respondents were majorly small-scale fishermen who use simple tools like nets, traps, and hooks, and are more at risk from environmental changes. While others like fish processors, traders, and community leaders play a role in the local fishing economy, this study focused on the fishermen themselves, since they are directly affected by climate-related risks in small-scale coastal fisheries (Adeyemi et al., 2021).

2.3 Sample size determination and allocation

To safeguard the representativeness of the study, a multistage sampling design that systematically incorporated variations across communities was employed, thereby ensuring that the distribution of respondents reflected the underlying population structure. From the many fishing villages in Ilaje, four: Ayetoro, Idiogba, Bijimi, and Asumogha were picked randomly. These villages were chosen because they were easy to get to and had a lot of fishing families. The sample size was worked out using Cochran's (1977) formula, a standard way to calculate sample sizes in social and environmental research. This method lowers sampling error and makes the results more reliable (Nwosu et al., 2022). It was decided to sample 50% of the fishing population in each village, as this amount captures variety and gives a good picture of the village structure (Adeleke and Oloruntoba, 2020). In total, 295 small-scale fishermen were picked through simple random sampling, ensuring fairness and equal representation across the villages studied.

The study also used Yamane's (1967) formula to figure out the sample size, shown as:

$$n = N1 + Ne^2$$

Where:

n = sample size

N = total fishing population in the study area (as obtained from fisheries associations or local government records)

e = level of precision (set at 0.05 for a 95% confidence level)

For example, if the estimated fishing population equals 1,000 individuals, the sample size would be approximately 280 respondents.

To adequately represent the fishing population in Ilaje Local Government Area (LGA), 295 questionnaires were distributed to artisanal fishers. This number included a 5% buffer above our target of 280, meant to offset potential non-response and incomplete submissions and maintain dataset dependability. Four major landing sites: Ayetoro, Idiogba, Bijimi, and Asumogha were selected based on their importance to local fisheries and their role as socio-economic centers for fishing communities.

The estimated fisher population at each study site was calculated using the proportional allocation method as follows:

$$F_i = (n_i / N_s) \times N_t$$