

EVALUATION OF CURRENT CATCH ASSESSMENT STRATEGY FOR TANZANIA MARINE FISHERIES

GRO • FTP

Fisheries Training Programme

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Introduction

Understanding the impact of fishing on fish populations is essential for assessing sustainability and developing effective management strategies (Grantham et al., 2022).

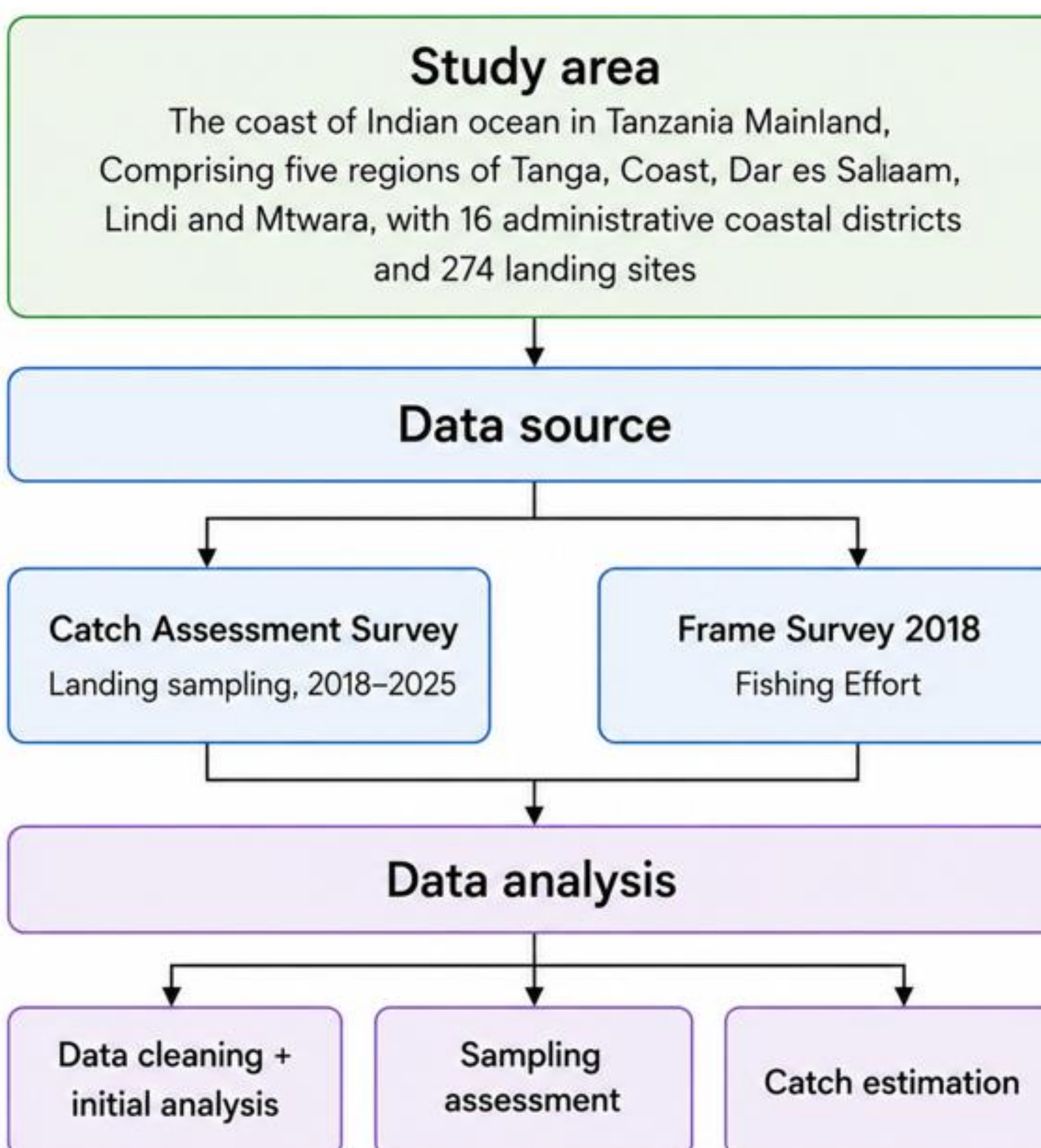
The electronic Catch Assessment Survey (eCAS) system is used in Tanzania to collect and analyse landing data from both marine and freshwater fisheries.

This study evaluates the current sampling strategy, data quality, and estimation procedures used in eCAS, aiming to improve catch assessments that are fundamental for effective fisheries management and stock assessment (Pelletier & Gros, 1991).

Objectives

- 1) To evaluate the adequacy and consistency of the current sampling coverage at marine coastal landing sites.
- 2) To assess data quality issues that may affect catch estimation.
- 3) To investigate how the eCAS system estimates catches.

Methodology



Results

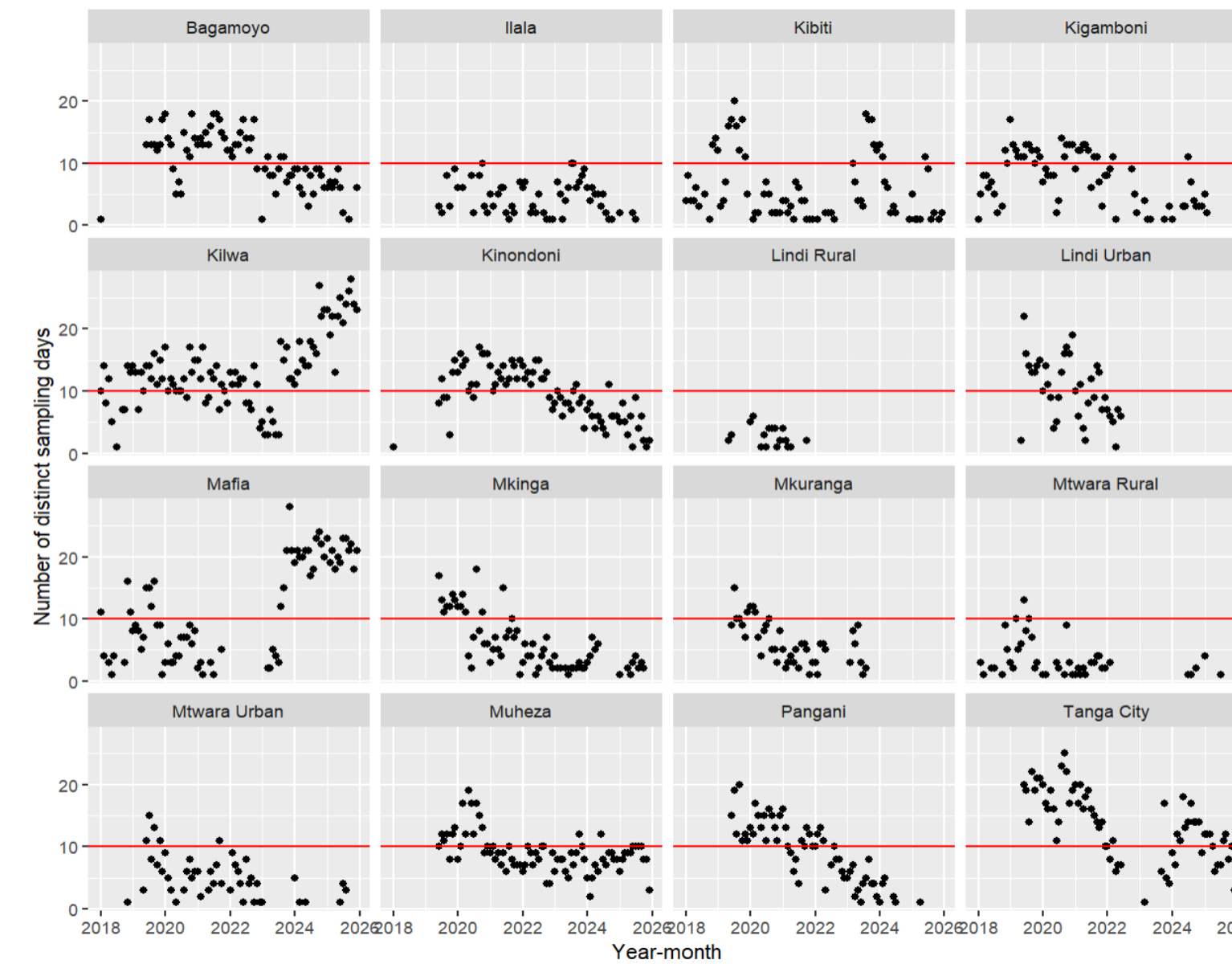


Figure 1. The number of distinct sampling days by month across coastal districts from 2018–2025, with the red horizontal line indicating 10 sampling days, showing a declining trend in sampling effort in several districts.

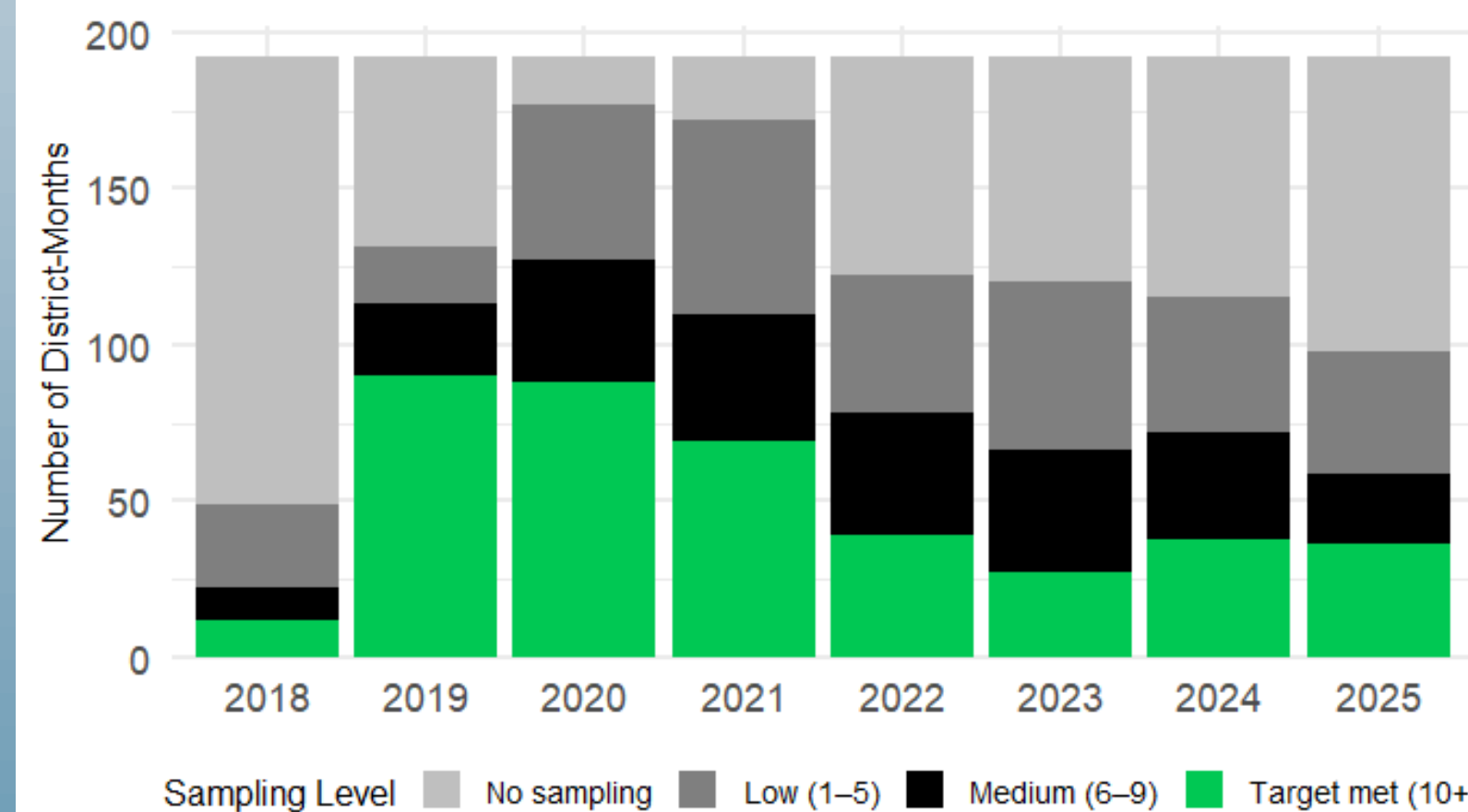


Figure 2. Annual distribution of district-months by sampling level, 2018–2025. Colours indicate no sampling, low sampling (1–5 days), medium sampling (6–9 days), or target met (≥10 days). The share of district-months meeting the target declined after 2021, indicating reduced sampling coverage in recent years.

Table 1. Number of species per fishing trip, showing the number and proportion of trips recording a given number of species. Most trips recorded a single species (82%), while multi-species trips were uncommon. This is not consistent with a multi-species fishery.

Number of species	Number of trips	Proportion
1	71,551	0.82
2	11,510	0.13
3	2,949	0.03
4	618	0.01

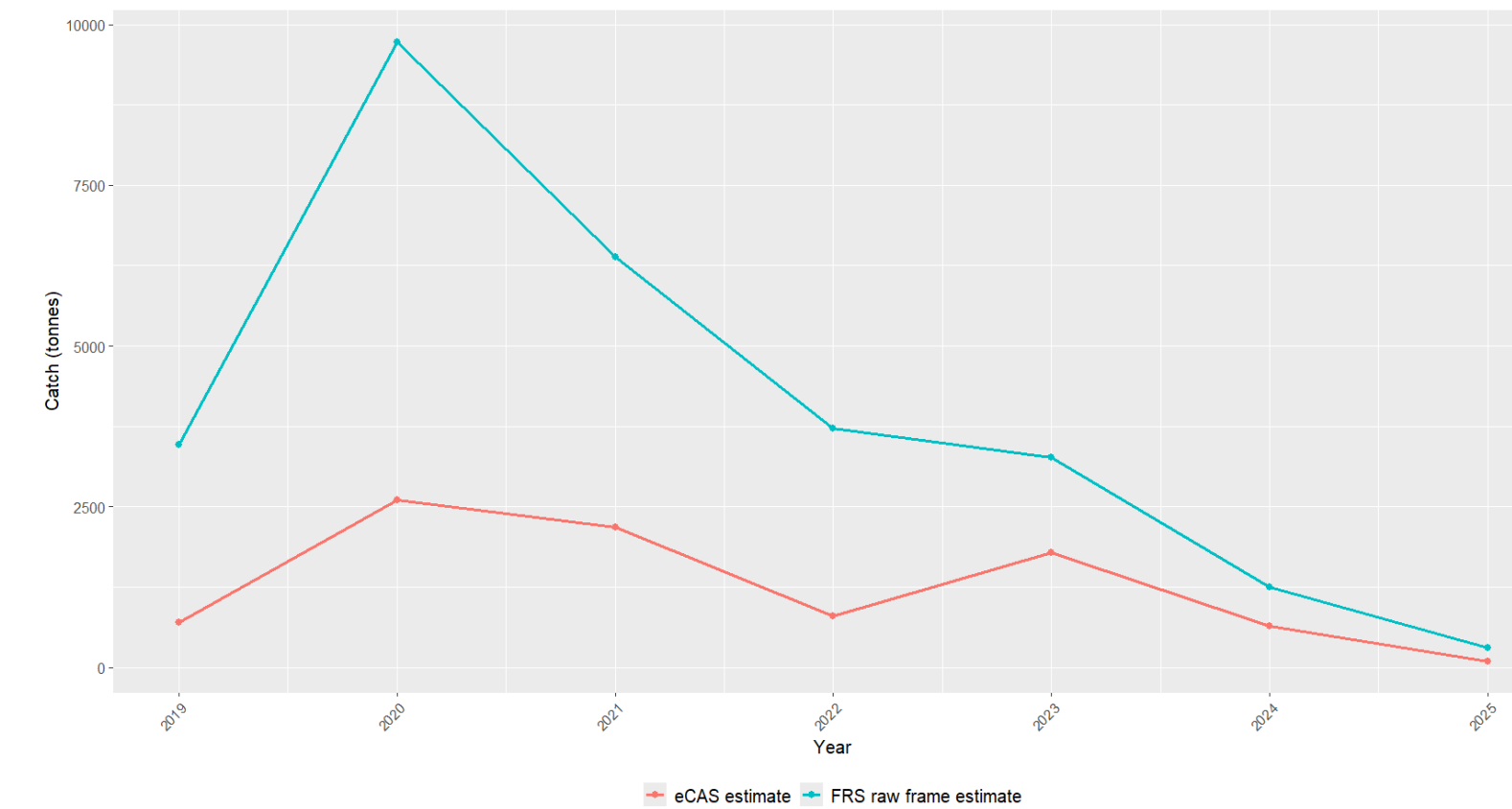


Figure 3. System-generated eCAS estimates and recalculated estimates for Ilala District. Both estimates peaked in 2020 and declined thereafter, but recalculated estimates were generally higher.

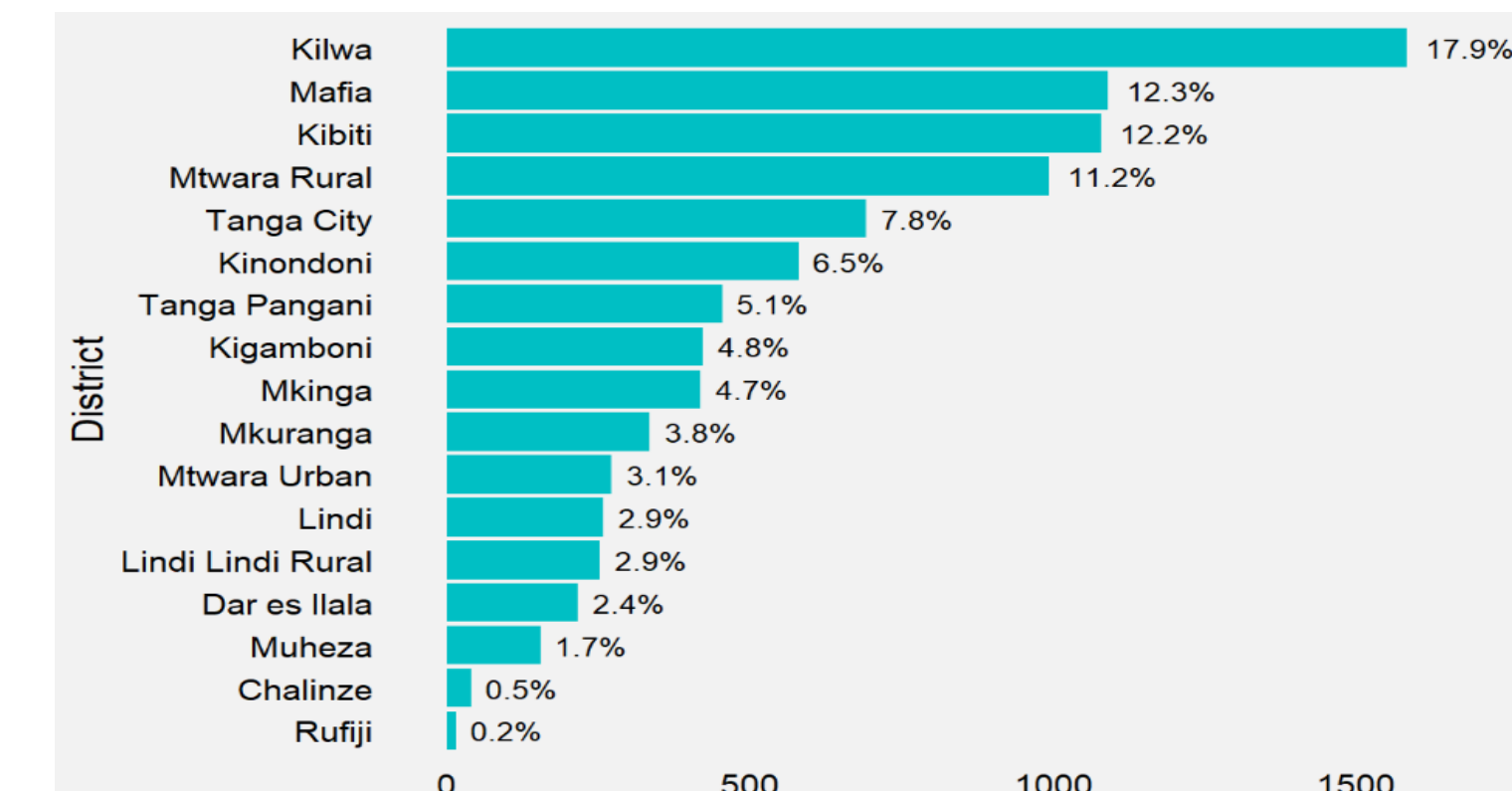


Figure 4. Number and percentage contribution of fishing craft by district. The distribution illustrates spatial differences in fleet and fishing effort concentration, with implications for the allocation and prioritisation of fisheries monitoring and sampling effort.

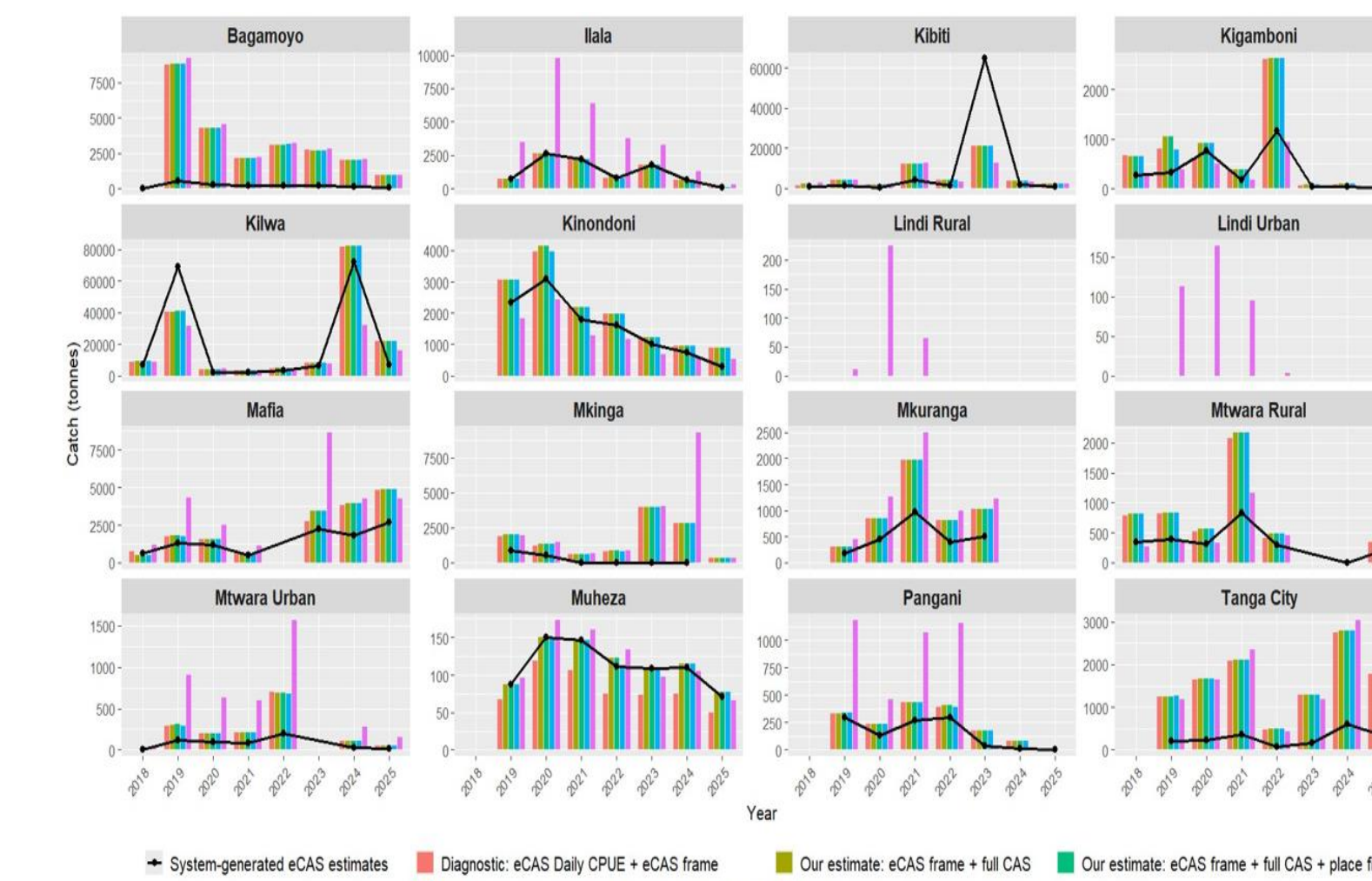


Figure 5. Annual district catch estimates from the eCAS system compared with estimates recalculated from the same eCAS dataset under alternative input and processing scenarios. Recalculated estimates generally followed the same trends as the system-generated eCAS estimates, but differences in some districts suggest that parts of the estimation process need clearer documentation.

Discussion and conclusion

- Sampling effort declined over time, and several districts failed to meet survey targets.
- Data quality issues included implausible trip times, duplicates, missing key variables, and limited species recording.
- Catch estimates were sensitive to sampling coverage, fleet size inputs, and processing choices.
- Although eCAS provides a valuable basis for catch assessment, improved sampling, data validation, and clearer documentation of estimation procedures are needed to strengthen confidence in coastal marine catch estimates.

Recommendations

- Revise species recording protocols to capture full catch composition per trip.
- Review and optimize sampling intensity to reflect the available resources.
- Provide regular enumerator training on species identification and data-entry procedures.
- Update the frame survey periodically to reflect changes in fishing activities.
- Conduct a technical audit to strengthen CPUE and effort integration in the eCAS system.
- Establish regular data quality checks and sampling performance reviews, supported by automatic reporting tools.

Acknowledgements

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