



# 5<sup>th</sup> SPC Regional Technical Meeting on Coastal Fisheries and Aquaculture

11–14 October 2022



Original: English

Information paper 4

## TAILS and IKASAVEA: Different approaches but same team

Andrew Halford, George Shedrawi, Franck Magron, Bernard Vigga, Andrew Hunt, Peter Williams, Bruno Deprez

## Summary

- TAILS and IKASAVEA are both electronic data capture platforms developed by the Oceanic and Coastal Fisheries programs, respectively. Both systems are designed to input data on fishing trips with TAILS focused on artisanal pelagic fisheries and IKASAVEA on reef and invertebrate fisheries.
- TAILS was developed within the regional oceanic tuna fisheries monitoring system (TUFMAN 2) and was designed to capture catches of nearshore pelagics, and reef fish species, if present. E-reporting (ER) has been a part of the TUFMAN 2 system for 10 years and TAILS is a natural extension of the historical paper-based system to capture pelagic species catches from artisanal fisheries.
- IKASAVEA was developed within the Coastal Fisheries and Aquaculture program in response to a major focus on invertebrate fisheries as part of the EU funded PEUMP program. It was therefore designed to capture information on the fine-scale and high diversity of coastal fisheries catches, inclusive of both fish and invertebrates.
- Part of the diversity of coastal fisheries includes different points of sale/exchange such as markets, roadside stalls and landing sites. IKASAVEA was designed to capture species level data from all these locations not just from boat landing sites.
- To help improve the ability of coastal fisheries agencies to measure the sheer diversity of sizes, shapes, and species found in coastal fisheries IKASAVEA has integrated AI into its platform to interrogate photos and automatically identify and measure individual species.
- Boat-based creel survey data captured in TAILS can be imported into an IKASAVEA database but due to differences in the data structure, and the option to collect aggregated data in TAILS, some data will have to be summarised to a coarser level.
- Preference for which platform to use (one or both) should be based on what are the important questions that need answering for any fishery. A simple assessment of required outcomes versus capabilities of the respective platforms will provide clarity.
- SPC can work with any interested members to help them make decisions about what platforms to use and, where relevant, how to meld datasets between the two systems.

## TAILS and IKASAVEA: Complementary e-data tools for capturing information on coastal fisheries catches

### *Background*

1. The coastal environment around PICT's is an incredibly diverse area that is home to an equally diverse array of fish and invertebrates, many of which are targeted by fishers for food and income. While reef and bottom associated species are most common there is also a significant component of pelagic species that are associated with coastal ecosystems.
2. Traditionally, there has been a division between management of oceanic and coastal fisheries, with data collection programs typically focused on one or the other. However, the increasing use of FADS

and in particular anchored FADS over the past decade has brought a greater range of pelagic species closer to shore and within the fishing capabilities of artisanal coastal fishers.

3. The increased use of anchored FADS by PICTs has increased demand for data collection from national fisheries agencies to better understand the catches that are being taken from around these systems by artisanal coastal fishers. TAILS was already being used to collect data from within the oceanic fisheries system, so it was a natural evolution to add the capability to collect data from anchored FADS electronically using TAILS.
4. However, because coastal fishers venturing out to anchored FADS were also likely to fish on coastal reef systems, any data collection system needed to be able to capture other non-pelagic fish species. TAILS subsequently incorporated the ability to collect data on other species to ensure that all fishes caught were being recorded from a vessel when it landed on shore. The types of data collected remained consistent with what was being collected on oceanic fisheries previously.

#### *A new team member: IKASAVEA*

5. SPC's Coastal Fisheries and Aquaculture Program began a multi-year program funded by the European Union from 2019 – 2025 (PEUMP) under which KRA 3 focused on sustainable management of coastal fisheries resources, targeting invertebrates.
6. TAILS provided a template for e-data collections and while the ability to capture coastal fish species was incorporated, this was not designed to incorporate all measurements and data collection priorities for invertebrates. It was also the case that given the diversity of species in coastal fisheries, data needed to be captured with a different focus.
7. Therefore, an e-data system was developed to deal with the challenges specific to coastal fisheries; namely, the huge diversity of catches, the different taxa, the varied points of landing/sale/exchange of fished product and the metrics used to quantify catches. The IKASAVEA app was designed as the front-end of this system where data can be entered directly from the field, like TAILS.
8. Because of the sheer diversity of coastal fisheries species, it was also decided to build an AI capability within the system to enable computing power to do a lot of the heavy lifting when it comes to identifying species and extracting length and weight measurements. By adopting a photo-based approach to data gathering the system can be used by both relatively inexperienced personnel, where photo-id capability can help with decisions in the field and back in the office, and by experienced field officers who have good identification skills and do not need to use photos when collecting data. The AI capability of IKASAVEA was also designed to facilitate photo-based monitoring of catches under community-based fisheries management programs, increasingly being promoted by fisheries management authorities.
9. Data captured by TAILS that is of relevance to coastal fisheries can be imported into the IKASAVEA based system, however due to data structure differences between the two systems, sometimes trip records will only appear in IKASAVEA as summarised data. Conversely, data captured by IKASAVEA that is of relevance can also be extracted and imported into the TAILS system, but again the data will need to be summarised to a common level prior to any upload.

10. To date there are around 5 PICTs utilising IKASAVEA to collect market/ fisher data, with another 14 indicating their support for integrating this system into their coastal fisheries programs. Countries using the IKASAVEA system are supported by the science and database teams within the Coastal Fisheries Program who provide support for integrating the system into their programs and improving their data sampling protocols.

### *TAILS: A purpose-built app for offshore and FAD catch monitoring*

11. TAILS was designed in 2015 as a tool to transition from the existing paper-based artisanal tuna data collection to electronic reporting. The software was developed as a prototype and refined in Nauru with the help of Nauru fisheries officers, to produce an electronic reporting tool that was easy to use in the field, provided reliable data collection in challenging conditions, and solved the problems that occurred from previous paper-based systems.
12. TAILS collects trip logsheets from returning fishers, including trip, catch and effort information. The fisheries officer can either enter the catch aggregated by species or measure each fish if they have the equipment available for each fishing event. Data are collected offline and then uploaded to the TUFMAN 2 database when internet is available. Usually, fisheries officers are the main users of TAILS, and they interview fishers returning from trips, however in some locations charter vessels and semi-professional fishers enter their own data, and in other locations community representatives collect data from the people in their village.
13. Each country that has used TAILS over the last 5 or 6 years has different monitoring objectives, some of which include:
  - Monitoring of fuel subsidy programmes
  - Generating national annual catch and value estimates from small-scale fisheries
  - Reporting artisanal fleet tuna catch estimates to WCPFC
  - FAD monitoring programmes
  - Broad community-based data collection to ensure baseline information in responding to natural disasters and emergencies
14. TAILS was developed to be a low-cost data collection tool for use in general data collection of small-scale fisheries, but originally aimed at pelagic and FAD fishing fisheries. It was anticipated that it would support and inform more targeted survey tools such as market surveys, creel surveys, household surveys and census information (obtained from IKASAVEA and other systems) in building a complete picture of the fishery.

To date there are around 10 PICTs utilising TAILS (in conjunction with TUFMAN 2 artisanal component), sometimes only in one area or on one island, and other times across the whole country. The data collectors are supported through the Oceanic Fisheries Programme support services that includes a dedicated person to troubleshoot technical difficulties. The development of “Frame Survey” data collection is currently being considered, which will contribute to more accurate national level annual artisanal tuna catch estimates in the future.