

Small-scale tuna fishing at Kadavu Island, Fiji

Robert Gillett¹

Introduction

In the past 50 years there have been many attempts to develop small-scale tuna fisheries in the Pacific Islands region. The main objective of that work has usually been to enable non-industrial fishers to take advantage of the relatively plentiful pelagic resources. Despite much development effort in most countries of the region, it is difficult to identify many success cases.

Kadavu Island, which is south of Viti Levu in Fiji, has been cited as a success story in small-scale tuna fishing development by several sources, including staff of the Pacific Community (SPC) and officials of Fiji's Ministry of Fisheries (MoF). To investigate the fishing situation at Kadavu, a short visit was made to the island in mid-August 2018. The trip was funded by an SPC/FAO (Food and Agriculture Organization) project on small-scale tuna fishery development.

Methodology

Prior to travel to Kadavu, senior officials of MoF in Suva were interviewed to obtain their views on Kadavu tuna fishing, the degree of success obtained, and reasons for that success. Hours of wide-ranging discussions were held with the very knowledgeable officer-in-charge of the Vunisea Fisheries Station (OIC/Vunisea). The chair of the Kadavu Fishermen's Association (KFA) was interviewed. During a meeting of KFA, several fishermen advanced their opinions of tuna fishing success and the role of KFA in that success. Information on general socioeconomic conditions on Kadavu was obtained from several knowledgeable individuals. Documentation on various aspects of fisheries development on Kadavu was made available by SPC and Fiji's MoF. This present report is, to some degree, oriented toward the situation in Vunisea and nearby areas due to the restrictions imposed by a short trip.

Information on Kadavu Island

Kadavu lies to the south of Viti Levu. The northeastern part of Kadavu (i.e. Dravuni) is about 38 nautical miles

south-southeast from Suva, while the southwestern part of Kadavu (i.e. Cape Washington) is about 65 nautical miles south-southwest of Suva. The distance from Dravuni to Cape Washington is 42 nautical miles. From Dravuni, it is closer to Suva than to Cape Washington.

The road network on Kadavu is quite limited, and thus most intra-Kadavu travel is by boat, most of which are fibreglass skiffs powered by 40 horsepower outboard engines.

There are about 75 villages on Kadavu. Administratively, the island is part of Fiji's Eastern Division and is divided into nine districts. The most 'urban' area is Vunisea, which has a government station, an airstrip, a wharf, and some non-sealed roads. There is a shipping service several times per week from Vunisea to Suva, which also services the Kavala area towards the eastern side of Kadavu.

Kadavu is a mountainous island. Much of the land is too steep for farming, hence there is a considerable dependence on marine resources.

The Ministry of Fisheries on Kadavu

MoF has an office in Vunisea (with four staff) and an office in Kavala (with two staff). The Vunisea staff consists of an officer-in-charge, a conservation officer, a fisheries assistant, and a handyman. The OIC, Anare Turaga, has been based in Kavala for six years. It is also noteworthy that Fiji's Minister of Fisheries is from Kadavu.

MoF keeps a fibreglass skiff at Vunisea and at Kavala. Both are not currently operating as the outboards have been in Suva for repair for over a year. Fisheries officers are able to charter a fibreglass skiff from the Kadavu Fishermen's Association for FJD 20¹/day plus fuel. MoF does not have a vehicle on Kadavu but the officers occasionally use the vehicles of other government departments.

MoF has an ice plant in Vunisea and one in Kavala, each of which has a daily capacity of 4 tonnes (t). Ice is sold to licenced fishers for FJD 0.13/kilogram (kg) and to everyone else for FJD 0.30/kg. The ice plants are maintained by Suva-based MoF technicians.

¹ Director of Gillett, Preston and Associates. Email: gillett@connect.com.fj

² FJD 1.00 = USD 0.47 (25/09/18)



Anare Turaga, Fisheries Officer-in-Charge at Vunisea on Kadavu. The Vunisea Fisheries Station sign is sideways because it was knocked down by Cyclone Keni in April 2017. Image: Robert Gillett

Kadavu pelagic fishing situation

In April 2017, Kadavu was hit by Cyclone Keni, which wiped out the five fish aggregation devices (FADs) that were in position at the time. In May 2018, seven FADs were deployed, all of which were (and still are) located off the north coast of Kadavu (four FADs) and the west coast of Ono and Dravuni (three FADs). The FADs were deployed just outside the reef in relatively shallow water, from 95 to 190 metres in depth. The deployments were done from the vessel *Bai ni Takali*, formerly operated by MoF, with supervision by the ministry's FAD specialist, Sailosi Drili. Funding for the FADs came entirely from MoF's budget.

According to the OIC/Vunisea, about 75% of current pelagic fish catches come from the FADs. Of the people currently fishing around the FADs, most (perhaps two-thirds) were pelagic trolling before the FADs were deployed but some were divers that did not like the cold, wet and dark work conditions. This has important implications for the concept of using FADs to move fishing effort from inshore to offshore areas (i.e. only a portion of the current FAD effort is from inshore areas).

Most FAD fishing is by trolling but there is some vertical longlining and handlining. Because the FADs are in

relatively shallow water, some handline fishing around the FADs at night for snappers and groupers is reported.

Certain areas of Kadavu produce much of the pelagic catch:

- Lomati: Five villages located just northeast of the western tip of Kadavu. This area has very little lagoon area as there is only a fringing reef. There is a significant heritage of pelagic fishing in this area.
- Galoa Island: Located inside the reef just southeast (windward) of Vunisea. Although the people on this island have access to a large lagoon area for fishing, there is very limited area for gardens, hence their increased dependence on the ocean for food.

The price of pre-mix outboard fuel is currently FJD 3.17/litre (L), while the price in Suva is FJD 2.45/L.

Results from the SPC 'Tails' fisheries data collection system indicates that in the sample locations across eight months spanning 2017 and 2018, 15% of fishing effort was by trolling and 26% of catches in Kadavu consisted of tuna. Because this data collection programme is one of the few sources of data on Kadavu fisheries, some additional attention is warranted (see box next page).

In the mid-2000s the SPC PROCFish programme conducted survey work in Fiji at Dromuna, Muavuso, Mali and Lakeba. Estimations of per capita fish consumption at those locations were made, which averaged 83.5 kg of finfish and invertebrates across the four sites.³ With a knowledge of Fiji, it could be stated that the consumption of fish at those sites is not remarkably different than in the villages on Kadavu. Applying the PROCFish level of consumption to the 10,000 people of Kadavu gives an annual consumption for the entire island for all types of fishing of 835 t. The Kadavu fish poster indicated that, at the sampled locations, about 6% of the catch is sold at urban markets (presumably Suva). This suggests that the total catch for Kadavu is about 888 t.

Post-harvest aspects of pelagic fishing off Kadavu

Some of the pelagic fish caught off Kadavu is consumed by family and friends of the pelagic fishers, some is sold in the village of the pelagic fishers, some is sold in Vunisea and Kavala, and some is sold in Suva. It is not possible to estimate the percentages of pelagic fish sold at the various locations, but the SPC 'Tails' fisheries statistical system indicates that for all fish (i.e. pelagic plus inshore), 10% is sold in communities, 28% is sold in provincial markets, and 6% is sold in urban markets.

KFA has an established price for tuna of FJD 7/kg. According to the OIC/Vunisea, in 2017 MoF sold 15 t of tuna for

FJD 7/kg. This is often in the form of 'sliced' tuna. MoF operates a slicing room with a slicing machine. According to MoF officials, slicing tuna enables individuals with small families to purchase part of a large tuna.

A Kadavu price for tuna of FJD 7/kg is remarkably high as the selling price for tuna in Suva (mainly longline bycatch) is often less than FJD 7/kg. In August 2018, Goldhold Seafood Ltd was selling sliced yellowfin in Suva for FJD 6.50/kg.

According to the OIC/Vunisea, there have been some attempts to market Kadavu fish (including pelagic fish) in Suva:

- In the past, Agro-Marketing purchased fish from Kadavu for sale in Suva, but fishers did not like the practice of being paid only in Suva and only after the fishing was sold to retail outlets.
- Premium Seafoods (also known as White Pearl) occasionally buys Kadavu fish for sale at their Walu Bay office.
- Some fishers take their fish to Suva on their own outboard-powered skiffs.
- The vessel *Bai ni Takali* has made some test purchases directly from fishers close to the fishing grounds for sale in Suva, but this vessel is no longer operated by MoF.

According to several fishers, the use of ice to keep pelagic catches fresh while at sea has increased since the SPC training. Fishers in the active tuna fishing area of Lomati take ice from the Vunisea ice plant, about 20 nautical miles away.

Indications of success in small-scale pelagic fishing off Kadavu

Senior MoF staff have indicated that small-scale tuna fishing development at Kadavu has been successful (A. Batibasaga and T. Toasi, Fiji MoF, pers. comm.). Similarly, SPC staff have also commented that small-scale tuna fishing is now thriving (M. Blanc, SPC, pers. comm.). These opinions are presumably based on the changes that these individuals have noticed over the years. At a KFA meeting, several fishers expressed satisfaction at the course of pelagic fisheries development and offered various reasons for the success.

³ Friedman K., Kronen M., Vunisea A., Pinca S., Pakoa K., Magron F., Chapman L., Sauni S., Vigliola L., Tardy E. and Labrosse P. 2010. Fiji Islands country report: Profiles and results from survey work at Dromuna, Muaiyuso, Mali and Lakeba (September to November 2002, April to June 2003, June and July 2007, and February 2009). Pacific Regional Oceanic and Coastal Fisheries Development Programme, Secretariat of the Pacific Community, Noumea, New Caledonia.

⁴ Although this information may contain some inaccuracies, it is important to realise that it comes from somebody who is likely to be the most knowledgeable person about fisheries on Kadavu; therefore, other stakeholders reading the poster probably have much less understanding of the limitations of the information in the poster.

⁵ The support for this data collection project from SPC will include this type of analysis once sufficient data have been collected.

Results of the SPC 'Tails' Fisheries Data Collection System on Kadavu

A prominent poster in the Vunisea Fisheries Office gives the Kadavu results of the SPC 'Tails' fisheries data collection system. The poster provides information on several aspects of fishing in Kadavu, including the number of fishing trips; percentages of the various types of effort (e.g. trolling, spearfishing); total catch; total cost of fuel, bait and ice; total weight and percentage of the important species groups; and percentage of the various channels of disposal. In short, the poster gives a lot of interesting, relevant and valuable information on the fisheries of Kadavu. The poster also contains a note that the results cover the period from 20 August 2017 to 30 April 2018 (i.e. about eight months).

In response to multiple questions during the present survey, the OIC/Vunisea provided some additional information on the 'Tails' system.⁴ The raw data are obtained by nine collectors who are themselves fishers, six of whom are regularly active at collecting data. The collected data are focused primarily on the data collectors' villages (except in the case of Ono Island, which is covered by a collector from Kavala). The information obtained by the collectors presumably covers all catches from the sampled landing sites.

Some observations can be made:

- The nine sites sampled represent 12% of the 75 villages on Kadavu and associated islands.
- Each sampled site was selected by MoF and, according to the OIC, they probably do not represent a cross section of all villages on Kadavu, but rather villages that are especially active in fishing.
- The total catch estimation given in the Kadavu Tails poster is a sampling that requires a raising factor to determine total catch for all of Kadavu, although this raising factor is unclear.⁵

There is some quantitative evidence suggesting that tuna catches are proportionally much more important in Kadavu than in other parts of Fiji:

- A USP study in 2008 and 2009⁶ of finfish fishing in 46 villages in 22 districts and 10 provinces in Fiji, and involving 2,802 fishing trips gives some indication of the relative importance of tuna in Fiji's coastal fisheries. It showed that, nationally, mackerels and tunas made up about 4.5% of the coastal catch.
- The results of the SPC 'Tails' fisheries statistical system on Kadavu for the period 20 August 2017 to 30 April 2018 (described above) indicate that 26% of the sampled catch was tuna. The high proportion of tuna in

the sampled catch appears even more remarkable considering that during some of the months covered by Tails, there were no FADs in position at Kadavu. Furthermore, some of the months covered by the Tails survey are low season months for surface tunas in Kadavu waters (August to November).

On reflection, in the present study it is difficult to separate two very different features: 1) the success of tuna fishery development in Kadavu, and 2) tuna fishing being historically important in Kadavu. On this matter, the study relies to some degree on the views of MoF staff and SPC, which suggest successful development.

Factors contributing to the success of pelagic fishing off Kadavu

In a short study of a few days it is not possible to determine with certainty why there is so much tuna fishing in Kadavu waters. What can be stated are possible and logical reasons for the development success and/or high production. This is based on stakeholder comments and on the observations and experience of the consultant carrying out the present study. In no particular order, some possible drivers of success in the Kadavu small-scale tuna fishery are:

- **Favourable geography.**
The shape of Kadavu and its associated reefs is such that much of the surrounding sea is, to some degree, protected from the prevailing wind and swell. The underwater topography and long distances to other islands may be responsible for a naturally high abundance of surface tunas (i.e. good tuna fishing even without FADs).
- **Fishing heritage.**
Many villages on Kadavu lack large areas of lagoon for inshore fishing. The hilly topography results in limited space for gardens for some villages. Both of these factors tend to encourage pelagic fishing. One stakeholder offered the opinion that many Kadavu fishers prefer pelagic fishing, which involves catching a few large fish rather than many less interesting small fish. There is also the fact that because Kadavu is a large island with a poorly developed road network, fast skiffs for intra-island transport are plentiful and available for offshore fishing.
- **FADS.**
There is no doubt that FADs make tuna fishing more productive. According to the OIC/Vunisea, about 75% of current pelagic fish catches come from the FADs. It should be noted, however, that in recent periods without FADs the proportion of tuna in the entire Kadavu catch has been high.
- **Development assistance.**
The fishers of Kadavu have enjoyed development assistance from Fiji's MoF and external agencies.
 - ⊗ The efforts of the competent and experienced OIC/Vunisea are commendable.
 - ⊗ According to the OIC/Vunisea, the installation of seven FADs in May 2018 was done entirely by MoF staff using funds from the ministry's budget.
 - ⊗ All stakeholders interviewed expressed a high degree of satisfaction with the training received in recent years from SPC, especially in the areas of tuna fishing techniques, tuna quality, and boat operation. 'High quality gear' from SPC is also cited.
 - ⊗ Other development assistance related to tuna fishery development has come from Japan (FADs in 2015 and 2016) and Korea (blast freezer).
- **Tuna slicing.**
MoF operates a slicing room with a slicing machine at both Vunisea and Kavala. According to MoF officials, sliced tuna enables individuals with small families to purchase part of a large tuna, thereby increasing the demand for tuna. Currently, MoF does not charge for freezing or slicing fish.
- **The Kadavu Fishermen's Association.**
According to KFA members, the association was able to set a price of FJD 7/kg for all fish sold by members. KFA is able to go straight to the Minister of Fisheries to discuss problems and request assistance, whereas individuals must make indirect circuitous approaches. KFA membership is more inclusive than other fisher associations in Fiji and, therefore, can speak with a louder voice to non-governmental organisations and the government.⁷ About three-quarters of KFA members do at least some FAD fishing.
- **The economy of Kadavu and kava.**
A striking feature of the sale of tuna on Kadavu is that prices are often higher than in Suva. According to several stakeholders this is because of the high income of many Kadavu farmers from a single crop: kava.⁷ With Kadavu's large production of kava and the price of kava approaching FJD 120/kg, Kadavu farmers and their relatives can currently afford to pay very high prices for fish.

Some comment should be made about factors that do not appear to drive Kadavu tuna fishing. Adjacency to the large fish markets in Suva does not appear to be a factor, especially in periods of high fish prices on Kadavu. Exports to Suva entail transport costs from the fishers' base to Vunisea or Kavala, ship transport charges from there to Suva, and transport and/or retailing charges in Suva for a price that is currently less than on Kadavu. Although there have been

⁶ IAS. 2009. A nation-wide survey of village-based fishing pressure in Fiji. In: Jenkins AP, Prasad SR, Bacchiochi J, Skelton P, Yakub N (eds). Proceedings of the Inaugural Fiji Islands Conservation Science Forum, Wetlands International-Oceania, Suva, Fiji.

⁷ The chairman of KFA is likely to have been a champion for tuna fisheries development, but is much less active and vocal now, having suffered a stroke last year.

efforts in the past by MoF, the Japan International Cooperation Agency and others to export fish, prices in Suva would have to be significantly higher than on Kadavu for this to be worthwhile for the fishers. Some fishers take tuna to Suva in their own fishing boats, but this appears to be mostly opportunistic transportation of fish on trips made for other purposes (e.g. carrying passengers). The Kadavu price is such that some resorts on the island import fish from Suva.

There does not appear to be much subsidisation of the Kadavu tuna fisheries. According to MoF staff, significant direct subsidies are now limited to: 1) a scheme by the Commissioner's office in which most of the price of a boat and/or motor is funded by that office (this was limited to 15 units in 2017)⁸; 2) the handing out of some fishing gear in the annual Yaubula Festival; and 3) MoF does not charge for freezing or slicing fish.

Concluding remarks

Many factors may be contributing to the success of Kadavu's tuna fishery development. In this short study of a few days it was not possible to determine with certainty which factors are the crucial drivers of development. The current high price of fish is obviously important, but all of the factors mentioned above seem to be significant. It is likely that the combined impact of all cited factors results in the current favourable development conditions.

For future attempts at small-scale tuna fishery development in other places in Fiji and neighbouring countries, it may be useful to indicate which of the favourable conditions in Kadavu are readily transferable to other locations.

- The factors that could conceivably be transferable to other locations appear to be FADs, high quality development assistance (including competent and motivated national fisheries officers), tuna slicing, and a strong fishers association.
- The factors that are not readily transferable appear to be the favourable geography, tuna fishing heritage, and a very valuable cash crop.

In scrutinising the above list of transferable factors, several appear related. FADs are important but even more important for the long-term is an efficient nationally funded FAD programme. A fisheries association and associated fishery champions could push for both FADs and for a national FAD programme, and possibly even for high-performing fishery officers.

It should also be noted that many of the transferable favourable factors are within the control of the MoF's fisheries management and development efforts. Efforts to promote pelagic fishing in other parts of Fiji (and perhaps in other Pacific Island countries) should focus on promoting those. In the selection of sites for small-scale tuna fishery development efforts, consideration should be given to those locations where there are favourable geographic features and some tuna fishing heritage. Also to be considered is that past attempts by MoF (or by predecessor agencies or other government departments) to stimulate fisheries development by subsidising transport to markets have not been catalytic nor have they been sustained.



Nambukelevu Mountain at the west end of Kadavu. The Lomati area consists of five villages located on the north shore just below the mountain. This area has very little lagoon area as there is only a fringing reef. There is a significant heritage of pelagic fishing in this area. Image: Robert Gillett

⁸ An SPC report states that 'Kava had been a cash crop in the 1930s, but its importance has significantly increased and it is now the paramount cash earner for Kadavu villagers. Kadavu is also a center for marijuana growing but the extent is unknown.' SPC. 2016. Initial diagnosis of the Kadavu Province, Fiji.

⁹ A scheme similar to this used in the early 2000s by the then Fisheries Department, in which selected fishermen put up one third of the price of a motorised boat and the Fisheries Department would pay the remaining two thirds.