

# The sea urchin harvesters of Navakavu, Fiji

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*Women dominate and play diverse roles in the sea urchin fishery – from collecting, processing and marketing. Women’s participation in the sea urchin fishery is largely undocumented in Fiji. This article presents new information on the fishery that is of value for researchers and decision-makers.*

## Introduction

In Fiji, the sea urchin *Tripneustes gratilla* is locally known as *cawaki*. Data for small-scale coastal fisheries, such as sea urchins and other invertebrate species, are sparse. Sea urchins have long been dismissed as being unimportant, despite the fact they are harvested as a source of income and food (Lee et al. 2018). Women dominate and play diverse roles in the sea urchin fishery, from collecting, processing and marketing. Women’s participation in coastal fisheries, or in any other sector, is frequently undervalued and underestimated (Thomas et al. 2021). The increasing awareness and recognition of women’s involvement in formal and informal sectors highlights the importance of collecting sex- or gender-disaggregated data.

*Tripneustes gratilla* is primarily harvested for subsistence and is a supplementary protein source in other fishing grounds (*i qoliqoli*). Sea urchins dominated the overall invertebrate catch for both artisanal and subsistence by 79.5%, according to O’Garra (2007), who estimated the total economic value of Navakavu *i qoliqoli* over a 20-year period to range between FJD 28,793,197 and FJD 29,164,050.

Sea urchins are harvested around the world, with the majority destined for the Japanese market (Sonu 2017). In 2016, Japan imported approximately 11,000 tons of live sea urchins and sea urchin roe valued at approximately USD 183 million, a more than six-fold increase in volume, and a nine-fold increase in value since 1975.<sup>2</sup> Much of this increase was due to an increased demand, decreased domestic harvest, and a subsequent price increase for sea urchin roe (Sonu 2017). Because it is a resilient and valuable species, the sea urchin has the potential to be cultured. Investigating alternative routes for sea urchin harvesters to achieve greater economic independence through sea urchin farming, could reduce the reliance on wild harvesting.

While government and non-governmental organisations have collected some basic information, there has been very

little effort to collate, synthesise and share recent *T. gratilla* information from various sources. The main objective of this study was to collect data for assessing and managing *T. gratilla* stocks in Fiji, and to identify knowledge gaps and explore potential opportunities to improve the value of the product.

## Field sampling

Yavusa Navakavu is a half-hour drive from Suva, Fiji’s capital. A part of the *qoliqoli* there was designated as a locally managed marine area in 2002. Muaivuso, Nabaka, Waiqanake, Namakala and Wainigasau are the three villages and two settlements, respectively, that make up the *Yavusa* (traditional linked unit or clan) known as *Navakavu*, in Suvavou District (Rewa Province).

Data on *Tripneustes gratilla* was gathered from 23 fisherwomen from *Waiqanake* and *Namakala* villages by the Ministry of Fisheries and Forestry. The information was gathered through key informant interviews. The survey was conducted on Wednesdays, Thursdays and Fridays over three consecutive weeks. Interviews were undertaken on the beach front while the women were deshelling the sea urchins they had harvested. Interview topics included the target fishery, reason for fishing, fishing methods, travel time to key fishing grounds, time spent fishing, and habitat types targeted.

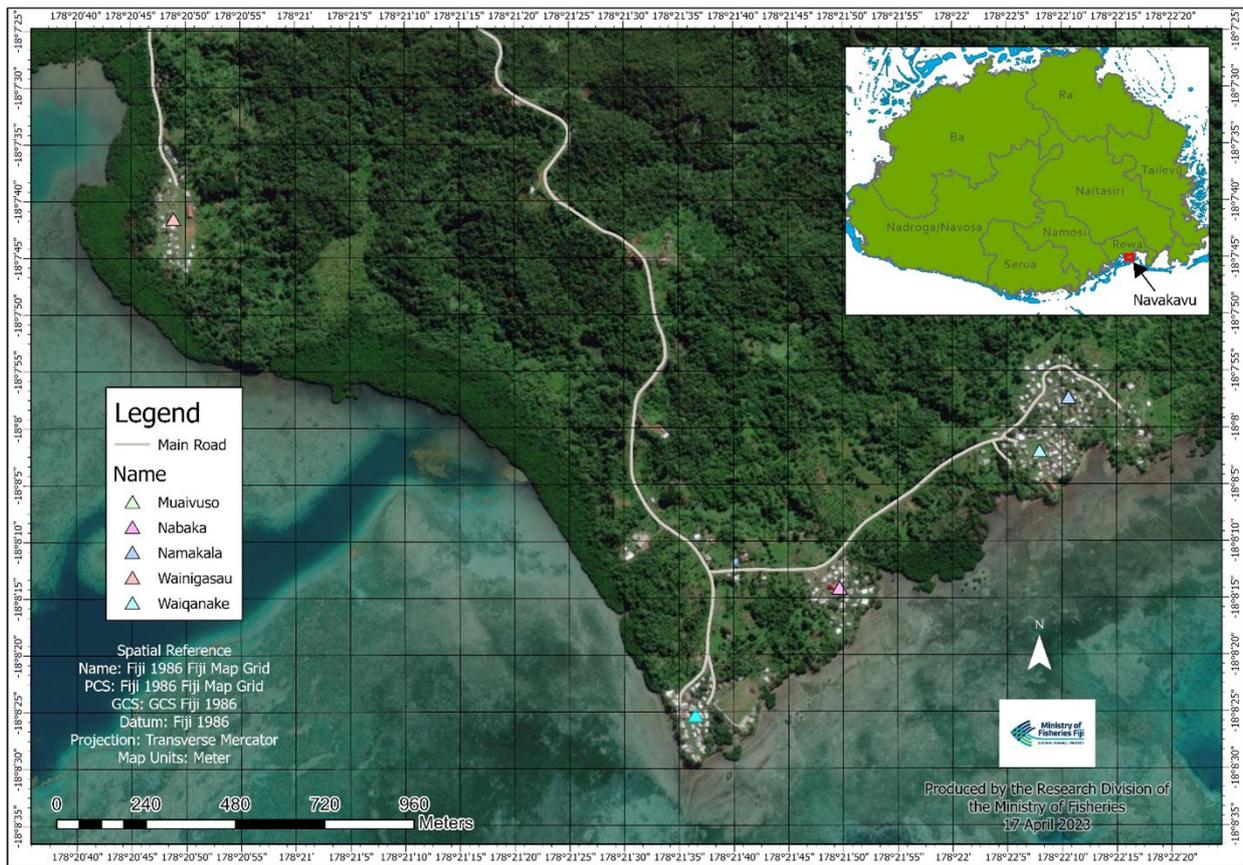
To determine the size of the urchins harvested by the fishers, the maximum width of the underside of each urchin in the sack was measured using a calliper to the nearest millimetre. Individual weights were measured using a waterproof scale. To determine the volume and price of sea urchins sold at the market, 20 women vendors were interviewed at the Suva market. Interviews were conducted on Fridays and Saturdays over three consecutive weeks. Information was gathered from individual vendors on the price of each container of sea urchins, the fishing ground they harvested from, the number of containers of sea urchins to be sold, and targeted customers and their preferences. To determine the actual volume of sea urchins to be sold, both the weight of the deshelled sea urchins in the container and the empty container were weighed.

The landing and market data collected were entered into the *Ikasavea* application.<sup>3</sup> This is a smartphone and tablet

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<sup>2</sup> <https://www.aquaculturenorthamerica.com/new-england-eager-to-cash-in-on-japans-hunger-for-sea-urchins>

<sup>3</sup> <https://www.spc.int/CoastalFisheries/FieldSurveys/MktSurvey>



The villages within Qoliqoli Navakavu. © Ministry of Fisheries and Forests



Weighing deshelled urchins (*Tripneustes gratilla*) stored in plastic containers. ©Kalisi Logatabua

application developed by the Pacific Community (SPC) that allows data to be entered offline, and then synchronised to the web portal once connected to the internet. Analysis and reporting of the data are done through this online portal, making information readily available for decision-makers.

### Traditional knowledge

Fijian traditional calendars are linked to planting and fishing activities (Veitayaki 2002). The women of Waiqanake Village always correlate harvesting to their surroundings. As explained by the women fishers, *T. gratilla* roe is fully ripe during the breadfruit season and full moon. During super tides and high wave activities associated with strong currents, *T. gratilla* mostly hide underneath rocks and are hard to find. This is the time when most women do not go out to harvest.

### Harvesting sea urchins

The majority of harvesters are women who typically harvest *T. gratilla* on Tuesdays, Wednesdays and Thursdays. Monday is usually the day to conduct village work whereby they engage in village meetings, cleaning and other activities assigned by the village headmen. Fridays and Saturdays are market days for the fishers. Fishers work in groups of two to three people (using boats owned by men), venturing out to shallow coral reef areas that emerge during low tides during the day. Women also engage in night gleaning. Fishers

mentioned that it is much easier to locate sea urchins at night than during the day. No specialised equipment is used, just knives and sacks. Urchins are collected by hand and kept in sacks in cool, dry places overnight or left on the boat. This is to kill off parasites associated with *T. gratilla* that, when they come into contact with the skin, cause itchiness.

### Processing sea urchins

The very next morning, the sea urchins are deshelled. Deshelling happens during high tide or beside a pool of seawater during low tide. A tablespoon is used to crack open the urchin's shell and to scoop out the gonads.



A fisherwoman from Waiqanake deshelling a sea urchin (*Tripneustes gratilla*) next to a tide pool during low tide. ©Kalisi Logatabua

Once the gonads are removed from the shell, they are properly cleaned in seawater and kept in plastic ice cream containers. Afterwards, the urchins are transferred to the deep freezer to await their sale. A 50-kg bag of sea urchins can fill up one 4.5 litre ice cream container. During peak season, this 50-kg bag can fill one 4.5-L bag plus one 2-L ice cream container depending on the size of the gonads.

### Selling sea urchins

Women from *Yavusa Navakavu* dominate the sea urchin market in Suva, particularly on Fridays and Saturdays. The women must travel either by bus or taxi to Suva to sell their catch, which is either sold whole with the shells on in a coconut basket (*i-su*), or only the gonads kept in plastic containers. Whole urchins are sold in 4.5-L containers that cost FJD 100, or in 2-L containers that cost FJD 50. Gonads packed in small containers are sold for FJD 5 for small or medium gonads, and FJD 20 for large ones. Major buyers of urchins are Pacific Islanders, especially Tongans and Samoans, as well as Asians. For export, agents and middlemen buy directly from the village.

### Income generated

The majority of the women fishers are satisfied with the income they earn from marketing sea urchins. As most of them mentioned, sea urchin collecting is an easy way to earn income because they are able to combine their household chores in a day with harvesting sea urchins for income.



A sea urchin (*Tripneustes gratilla*) is deshelled and the roe scooped into a 2-L ice cream container. ©Kalisi Logatabua

and food. Harvesting takes up to three to four hours per week. Money earned from the sale of sea urchins is spent on household and personal needs. According to one of the women who was interviewed, she was able to complete the construction of their house from the income she earned from sea urchin sales. One of the women interviewed also resigned from her job because she earned more from selling urchins.

### Challenges faced by sea urchin fishers

The major challenges faced by sea urchin fishers include the lack of a processing facility. The women must deshell sea urchins outdoors, in direct sunlight, thus degrading the quality of the gonads, and not meeting Hazard Analysis and Critical Control Point (HACCP) standards for export. Having access to an ice box and ice for preserving packed sea urchins for marketing would enable women to help improve the storage life of urchins, and improve the health and safety of the product being sold. Proper protective clothing during harvesting and processing is needed to prevent sickness associated such as flu, pneumonia and hyperthermia. Fishers also felt they had limited knowledge about food hygiene and protection to produce safer seafood products.

### Conclusion

Sea urchins are not subject to any regulation. Women fishers from Waiqanake Village have been identified as the main harvesters and marketers. The women use simple methods for collecting and packaging sea urchins. There is, however, a need to introduce control measures and a management system to prevent overfishing of this important commodity.

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Fisheries officers interviewing women vendors at the Suva municipal market. ©Unaisi Nalasi