

## A snapshot of freshwater prawn (*Macrobrachium lar*) collection activities in Naone community, Vanuatu

### Background

There are about 210 currently known species of freshwater prawns in the genus *Macrobrachium*. These prawns are widely distributed throughout the world's freshwater systems, lakes and creeks, largely in subtropical and tropical regions (Sethi et al. 2014) and have been an important source of food security and livelihood for people (Nandlal 2005).

Several species of freshwater prawns are known to occur in Vanuatu, including *Macrobrachium lar*, and these are widely found throughout the islands (Nandlal 2005). The island of Maewo is one of several islands in the Vanuatu archipelago where shrimp stocks are abundant (Amos 2007). *Macrobrachium lar* is the focus of this study.

*Macrobrachium lar* is a designated fishery under the Vanuatu Fisheries Act, and an important freshwater fishery in Vanuatu. Indeed, it plays an important role in food security and is a source of income for local people (Nandlal 2005).

Various prawn harvesting methods have been recorded and include collection by hand, push nets, woven traps and fine spears (Nandlal 2005). On Maewo Island, one of the most common methods is pond fishing, which involves diverting water into existing rock pools or dugout earth ponds on the side of the riverbank (Fig. 1). Feed such as coconut, manioc, taro or pawpaw is then placed into the pond to attract the prawns. A day or two after food has been placed in the ponds, the water intake is cut off and the pool is drained to expose the prawns, which can then be collected by hand.



Figure 1. An example of earth pond dug on the side of the riverbank. (image: Jason Raubani)

Fishing for *M. lar* on Naone Island dates back centuries. The first recorded interaction was by Charles Bice (Bice and Brittain 1886), the first Anglican missionary to the island. He recounts a scene where natives used the midribs of coconut leaves to make a trap to catch prawns to eat while tending their water taro gardens.

The commercialisation of prawns did not begin until the late 1980s and early 1990s. Since then, prawns have become a key economic activity of the people of Naone community. However, collection activities back then were not documented, and as a result, the production level during this period is unknown.

In 2017, the Vanuatu Fisheries Department (VFD) recorded for the first time that a production volume of 927 kg of prawns had been exported from Naone to the two main urban centres in Vanuatu, Port Vila on Efate, and Luganville on Santo (Vanuatu Fisheries Department, unpublished data). This figure, however, does not include the volume consumed by the community itself. Prior to that, there was no effort to capture that information or any information related to prawn collection. In the period between 1990 and the early 2000s, up to 100 kg of prawns were reported to be exported by air on a monthly basis to Port Vila and Luganville (Mr A. Weris, prawn fisher, pers. comm., 7 January 2019).

The main author of this article is a member of Naone community. The four decades of continued commercial collection of *M. lar* – coupled with the unknown level of production, stock and the social and economic contributions – have always been a huge interest to him. As such, he has taken the initiative to undertake this study.

Therefore, the purpose of the study was to document and understand the activities of the prawn collectors and try to establish a snapshot of their collection activities, production levels, social and economic returns, and their views on the status and management of the stock. This study was carried out through interviews conducted with some of the key active prawn collectors.

## Methodology

The study area covers Naone community (Fig. 2), which is located at the northwestern part of Maewo Island in Penama Province, Republic of Vanuatu. It consists of the main village and a few clusters of 1–2 households on the outskirts of the village. The community has around 37 households and a total estimated population of about 200 people, of which almost 40% are women and girls. More than half of all households have engaged in prawn collection at some point over the past few years. A portion of a river that runs through the study area is the main collection area. The river runs above the community and parallel to the coastline, and cascades into the ocean beside the main village. This river is usually referred to as “Big Wota” (which means big river), and it is the biggest and longest river on the island.

In January 2019, a survey of some of the key active prawn collectors in the study area was conducted. In total, 12 people were interviewed, 4 of whom were females. Interviews were voluntary and conducted in the local dialect of the study area.



Figure 2. Map of the study area.



Local freshwater prawns, *Macrobrachium lar*. (images: Pita Neihapi (L) and Glen Alo (R), Vanuatu Fisheries Department)

## Results

Twelve prawn collectors, eight men and four women, were interviewed in January 2019. They ranged in age from 30 to 60 years and have been engaged in prawn collection for three to over ten years. This figure represents over 90% of the active prawn collectors in 2018.

The main collection area spans a total distance of about 3 km of the river. The average width of the river ranges from 5 m to more than 20 m, with depths ranging from less than 1 m up to 10 m.

All prawn collectors interviewed use the pond collection method and collected prawns either daily or twice a week. Most preferred collecting during the early morning, although two people said that afternoon collection times produced higher yields than morning collection times. Most collectors said they spend 1–2 hours each time, while one person reported 3–4 hours.

Most collectors reported having one pond each but two reported having two ponds. Ponds were located on both sides of the river at about 50–200 m from each other along the riverbank, and sizes ranged from about 1 m<sup>2</sup> to less than 5 m<sup>2</sup>. Pond ownership can change from one collector to the other at different times but with permission from the original owner.

Most collectors indicated that their average weekly production in 2018 was about 1–2 kg, but one collector reported an average catch of 3–5 kg and two reported average catches of 5–10 kg. Asked if there were any observed difference in their average catch in the past 5–10 years, all reported seeing

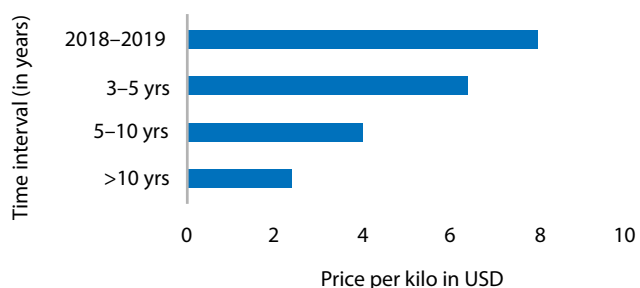


Figure 3. Increasing trend in price per kilogram of prawns over the years.

no difference. In addition, all but two collectors stated that in order to collect the same volume, they do not need to put in more effort today than they did in the past 5–10 years.

All collectors reported that not all of the prawns they collected were for sale, and that they took a few home for personal consumption. The survey found that in Naone community prawns are consumed on average between two and three times a week by over 50% of all households.

From 2017 to 2018, collectors reported that the price offered for 1 kg of prawns was USD 8.00.<sup>1</sup> Between three and five years ago, the price/kg was USD 6.40, and five to ten years ago it was USD 4.00. Over 10 years ago the price was about USD 2.40. Collectors reported that the price increase was mainly due to market demand. Figure 3 illustrates the continuous increasing trend in the price of prawns over the years.

All collectors confirmed that income generated from the sale of prawns was their most consistent income source, and two stated that it was their number one income source for 2018. Other cash income sources include copra, taro, kava, business and labour. Kava and labour top the list of income sources for the rest of the collectors. The average annual income for 2017 and for 2018 from prawn sales was estimated to be around over VUV 900,000, which is equivalent to USD 7200.

On the question of whether an increase or decrease in the state of the shrimp stock was observed, all collectors responded that based on their production, they had not noticed an increase or decrease in the state of the stock over the past 5–10 years. However, all collectors agreed that management controls should be put in place now to ensure the long-term sustainability of the fishery. Collectors proposed that if management controls were to be put in place, they should focus on protecting juveniles, using minimum size limits, and imposing a ban on the harvest of berried females. However, they all agreed that enforcement of such controls would be a challenge. One collector proposed that collectors, or the community, should be organised and take the initiative of self-managing the fishery and put in place and enforce management controls to ensure sustainability for their long-term social and economic benefits.

<sup>1</sup> 1 USD= 125 VUV (<https://www.xe.com/currencyconverter/convert/?Amount=900%2C000&From=VUV&To=USD>; Accessed on 25 March 2020)

## Discussion and conclusion

From the study, it was evident that almost all households in Naone community were engaged in prawn collection at some point over the past few years. In addition, prawn collection is not a gender-specific activity, and both males and females participate in prawn collection.

Out of all the collection methods, pond fishing was the only method used by the prawn collectors who were involved in the interviews.

The results indicate that Naone community sold 936 kg of *Macrobrachium lar* in 2018. This figure was consistent with the production figure for 2017, as reported by VFD, which was 927 kg. Based on this figure, it means that in 2018, income generated from prawn collection was about VUV 936,000 (USD 7488).

Based on the 2018 production figure of 936 kg, this would mean that monthly production is around 78 kg. This is a 22% decrease from the *ad hoc* historical information that 100 kg used to be exported per month more than a decade ago. This decrease may indicate a decrease in stocks. However, other factors could be at play and a more in-depth study is needed for verification, especially given the responses from all collectors that there was no observed decrease in the prawn stock based on their catch production.

Given the significance of prawn collection to food security and livelihoods, and the increasing demand as shown by constantly increasing prices (Fig. 3), collectors agreed that control measures should be put in place to ensure long-term sustainable benefits, and that such measures should focus on protecting juveniles and berried females. However, to put in place effective management measures, understanding the reproductive biology of the prawns is critical (Sethi et al. 2014).

Today, the fishery remains open access with no management controls in place, either from the community or VFD as the government agency responsible for the sustainable management, conservation and development of fisheries in Vanuatu.

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