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RESEARCH REPORTS IN THE ECONOMICS OF GIANT CLAM MARICULTURE

Working Paper No. 31

Exports and Export Markets for Giant Clam
Products in the South Pacific: Fiji, Tonga and
Western Samoa

by

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**Exports and Export Markets for Giant Clam Products in the
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by

Luca Tacconi² and Clem Tisdell³

March 1992

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Research for the project *Economics of Giant Clam Mariculture* (Project 8823) is sponsored by the Australian Centre for International Agricultural Research (ACIAR), G.P.O. Box 1571, Canberra, A.C.T. 2601, Australia. The following is a brief outline of the Project:

The technical feasibility of culturing giant clams for food and for restocking tropical reefs was established in an earlier ACIAR project. This project is studying the economics of giant clam mariculture, to determine the potential for an industry. Researchers will evaluate international trade statistics on giant clams, establish whether there is a substantial market for them and where the major overseas markets would be. They will determine the industry prospects for Australia, New Zealand and South Pacific countries, and which countries have property right factors that are most favourable for commercial-scale giant clam mariculture. Estimates will be made of production/cost functions intrinsic in both the nursery and growth phases of clam mariculture, with special attention to such factors as economies of scale and sensitivity of production levels to market prices.

Commissioned Organization: University of Queensland.

Collaborators: James Cook University, Townsville, Queensland; South Pacific Trade Commission, Australia; Ministry of Primary Industries, Fiji; Ministry of Natural Resources and Development, Kiribati; Silliman University, Philippines; Ministry of Agriculture, Fisheries and Forests, Tonga; Forum Fisheries Agency, South Pacific; ICLARM, Manila, Philippines.

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Exports and Export Markets for Giant Clam Products in the South Pacific: Fiji, Tonga and Western Samoa

ABSTRACT

This paper explores the giant clam meat export experience of Fiji, Tonga and Western Samoa. This is done by reporting on interviews conducted during fieldwork in these countries and by presenting secondary data. For Fiji, the introduction of an export ban for giant clam products meant the interruption of an (unsustainable) export of more than 30Mt of meat per year. A future clam mariculture industry can therefore look towards at least re-acquiring this share of the market. Western Samoa and, to a lesser extent, Tonga have limited experience in clam export due to limited naturally available clam stocks. In Tonga, there is however some commercial export taking place in the Vava'u group. For export purposes, the Vava'u group appears to be in a better position than the Ha'apai group because of favourable air links to overseas markets.

Keywords: Giant Clam Farming, Mariculture, Fiji, Tonga, Western Samoa, export of giant clams.

JEL Classification: Q57, Q21, Q22.

Exports and Export Markets for Giant Clam Products in the South Pacific: Fiji, Tonga and Western Samoa

1. Introduction

The identification of export markets and likely demands is important if giant clam culture is to bring tangible economic benefits to the people of the South Pacific states. Tacconi and Tisdell (1992a) noted that domestic demand for giant clam meat is quite limited in Fiji, Tonga and Western Samoa. Thus, a sizeable export demand would seem necessary if the economic benefits from giant clam farming are to be spread to a large number of growers.

Several studies have reviewed and attempted to assess the export markets for giant clam products (eg Shang et al., 1991; Tisdell and Wittenberg, 1990; Stanton, 1990; Dawson, 1986). The objective of this report is to bring together information on the export experience of the three countries surveyed. In other words, instead of directly surveying overseas markets, the reports taps on the knowledge of overseas markets available to local seafood exporters and also explores the limited statistical information available on giant clam exports from the countries considered.

The objective is achieved by reporting on interviews with local exporters and by presenting secondary data collected during fieldwork in the period of 28 August - 3 October 1991.

The experience of the three countries considered is presented in separate Sections.

2. Giant Clam Exports By Fiji

Among the three countries considered, Fiji is the one that saw the largest commercial export of giant clams. The Fisheries Division found commercial exploitation for export to be the most serious cause of clam stock depletion. A ten year export ban was thus enforced in December 1988. There has not been any attempt to regulate exploitation for the domestic market and for subsistence consumption. Conservation of giant clams presents several problematic aspects that are addressed in Tacconi and Tisdell (1992b).

Detailed data on clam meat exports are available only since 1984, when export licensing was first introduced and are presented in Table 1.

Table 1: Export of giant clam meat from Fiji

Year	Weight (kg)
1984	7,276.5
1985	20,794.7
1986	16,806.0
1987	5,490.0*
1988	38,493.0

* Data available only for the period September-December

Sources: Fiji Fisheries Division (1986a)

Fiji Fisheries Division (1987)

Fiji Fisheries Division Files

In 1984, licensed exports for giant clam meat (mantle and muscle) amounted to 7276.5kg. The countries of destination were New Zealand ('meat'), Australia ('mantle' and 'muscle') and Taiwan ('muscle'). It is thought that the produce shipped to Australia was being re-exported to Asia. A sample shipment was also made to Japan (15kg).

In 1985, a large increase in exports was registered. The export for the year was 20,794kg and was distributed as reported in Table 2.

Table 2 Distribution of Giant Clam Exports by Product And Country (1985).

By Product		Weight (kg)
'Mantle'		6,355
'Muscle'		7,180
'Meat'		3,341
'Mantle/Muscle'		3,823

By Country	Weight (kg)	Product
New Zealand	7,970	(mainly muscle)
Australia	5,291	(mainly re-exported muscle)
Taiwan	1,824	(muscle)
Hong Kong	1,280	(muscle)
USA	421	(muscle)
Canada	100	(mantle)

Source: Fiji Fisheries Division (1986a)

Small quantities were sent as samples to Canada, Australia, Hong Kong, Singapore, New Zealand and Japan. Unfortunately, the outcomes of these marketing tests are not known.

In the first seven months of 1986, total exports amounted to 11,316kg. In the same year, from the end of August to December a further 5,490kg were exported. A sharp increase in exports occurred in 1988, the last year of clam export. From the Fisheries files, total licensed exports amounted to 38,493kg, an average of just over 3Mt per month.

Exporters were not required to disclose the export price when applying for export permits, but the Fiji Fisheries Division hypothesised that they ranged between F\$20 and F\$40 for the muscle, as a commercial operator was reported to purchase the muscle in Suva for F\$7-10.5kg during the period 1985-86 (Fisheries Division, 1986b).

Three major commercial operators that had been active in the export of clam products were interviewed. The reported FOB export prices for the muscle ranged between F\$12 (1986-87)

and F\$26 in 1988. Two of these operators used to collect clams with their boats and also bought from local fishermen. The third operator collected clams with its own boat, but also invited local fishermen to collect clams and would buy the catch from them. It was a common marketing strategy to export the adductor muscle and to sell the mantle locally for F\$0.5-2kg. Limited exports of mantle, as sample and for commercial purposes (F\$1.5kg), were reported by these operators.

The above mentioned operators (and a fourth fish exporter) thought that they could export sizeable quantities, according to one operator up to 3Mt per week, of clam adductor muscle to countries such as Taiwan, Japan, Korea and USA. The extent to which the export price is sensitive to an increase in the quantities exported is not known, however one operator thought that he could export up to 20Mt a year without affecting the price (suggested price F\$20-40 depending on quality).

It should be noted that this price estimate appears to be quite consistent with the prices for giant clam muscle reported by Shang et al. (1991) for Taiwan. Shang et al. (1991) estimated that the price for adductor muscle ranged between U\$7.69/kg for muscle of less than 100g in weight, to U\$30.77/kg for muscle of more than 400g. However, it seems quite unlikely that the price for the muscle of cultured giant clams could be close to the upper limit of this range, unless very long harvesting cycles are adopted.

Shang et al. (1990, p. 11) report that a five-year old *Tridacna gigas* (the fastest growing giant clam) could yield an adductor muscle of 290g (470g for a seven-year old). This appears to be a large overestimate of the actual weight/age ratio for adductor muscle according to data derived from research at the Orpheus Island Research Station, James Cook University. The average wet weight for the muscles of ten 5-year old *Tridacna gigas* was found to be 54.81g (standard deviation is 13.88). The mean dry weight was 12.99g (standard deviation 2.99). (P. Lee, pers. comm. with L. Tacconi).

Whether giant clam adductor muscle is a substitute for other products, and therefore the extent of market competition that it faces, is another open question. One operator suggested that adductor muscles in the size range of 20-200g would be in competition with scallops. Muscles over 200g would have their own market and would attract higher prices. However, another operator thought that clam muscle would be in competition with abalone rather than with scallops.

3. Giant Clam Exports From Tonga

Detailed statistical information on export of giant clams from Tonga are not available. McKoy (1980) reports that a private operator engaged in clam meat exports in the mid 1970s, but operations ceased in 1977 because of the unavailability of sufficient stocks. From anecdotal evidence it seems that another operator was involved in heavy short-term exploitation of clam stocks in the Ha'apai group.

The Government of Tonga has not introduced a ban on the export of clam products. Due to the limited stock there is little export and this is not perceived as a threat to clam stocks.

Presently, there appears not to be any commercial exporter in Tongatapu. Friendly Island Marketing Co-operative Ltd, based in Nuku'alofa, exported small quantities of frozen muscle and mantle to Hawaii during the period 1986-87. They discontinued exporting 'because there was not enough supply'. Records of export prices and quantities were not available.

A returned migrant from the USA reported that, in two successive trips in 1986 and 1987, he sold 2Mt of frozen clam meat among the Tongan community in California. The clams were sold in less than a month at a price of US\$10/kg the first time and US\$10/2lb (US\$11/kg) the second time. This might be an indicative price that could be obtained for commercial exports to the Pacific community in the West Coast of the USA. The size of this market needs to be determined.

Limited exports were also reported to have taken place from the Ha'apai group to PagoPago (American Samoa). This export activity was interrupted in 1982 when the air service between Ha'apai and PagoPago was suspended. The export price for mantle was T\$6kg (T\$/A\$1) but records are not available for the price of the muscle and for the quantities exported, which were defined by the exporter as 'limited'. Sporadic export of whole clam meat to PagoPago was also reported in the northern archipelago of Vava'u. Export of about 50kg per week took place for about two years until March 1991, when it was interrupted 'because of non-profitable prices in PagoPago'. The purchasing price in Vava'u was T\$5kg and CIF export price US\$6kg (approximately T\$11kg).

A commercial operator is presently active in giant clam exports in Vava'u. This operator has a special agreement with a number of fishermen. They sell all their catches to the operator who exports, once a week with a chartered plane, the best quality fish and sells locally the

catch that cannot be marketed overseas. Undisclosed quantities of adductor muscle are exported 'via PagoPago to Japan, London and Frankfurt'. Sales are arranged through fish-brokers and not directly to customers. The export price was not disclosed.

As noted by Tacconi and Tisdell (1992a), a large share of clam meat, sold at local markets in Tonga, is probably sent to Tongans living overseas. This may well account for the largest share of clam exports, as some interviewees hypothesised that up to 50 percent of the clams marketed in Nukualofa might be sent overseas.

The impact of this unofficial export activity on the Tongan natural stock of giant clams cannot be assessed. In fact, given its 'underground' character, it is extremely difficult to gauge the size of this 'market'. Because of this unofficial character of private clam meat exports, it is doubtful that an export ban imposed to protect the natural stock of clam would work. At present, the Tongan Ministry of Fisheries is not contemplating introducing a ban on exports. Other conservation measures are going to be implemented in this country and they are discussed in Tacconi and Tisdell (1992b).

4. Giant Clam Exports From Western Samoa

As a matter of fact, there is not much to be said about exports of giant clams from Western Samoa. There is little evidence to suggest that commercial exports of clams have ever taken place from Western Samoa. The only noteworthy fact is that the commercial maricultural activity based in Namu'a Island had received enquiries on availability of supply of giant clam meat from a New Zealand chain of food stores. This indicates a certain degree of interest in clam products in the New Zealand market.

5. Conclusion

The evidence from Fiji suggests that a newly developed giant clam maricultural industry could fill a gap in supply created by the ban imposed in 1988 on exports of clams taken from the wild. This gap could be around 30Mt a year. On the local market, the maximum price paid for the adductor muscle was around F\$10/kg.

If the price is assumed to be in the range of F\$5-10/kg, the value of muscle exports would be F\$150,000-300,000. At this stage, it does not appear to be a very large market but, when

considered jointly with the domestic market, it can provide a good basis on which to start an economically-sound clam industry.

With respect to Tonga, the Vava'u group seems to be favoured for the eventual establishment of commercial giant clam farming. A local and already active exporter of giant clam could provide needed market knowledge and also an already established working relationship with local fishermen. Also, Vava'u has good access to cheaper international transport via the American airport of PagoPago, when compared to the Ha'apai group.

6. Acknowledgements

Research for this paper has been supported in part by the Australian Centre for International Agricultural Research (Research Project No 8823). We are grateful to all those mentioned in the Appendix who provided valuable assistance with this research. The usual *caveat* applies, namely that we alone are responsible for the views expressed in this paper.

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APPENDIX

Persons met during fieldwork

FIJI

Tim Adams	Acting Director, Fisheries Division
Esaroma Ledua	Fisheries Officer, Fisheries Division
Subodh Sharma	Fisheries Officer, Fisheries Division
Hamidan Bibi	Senior Fisheries Assistant, Fisheries Division
Jone Sogovale	Senior Fisheries Assistant, Fisheries Division
Apisai Sesewa	Senior Fisheries Assistant, Fisheries Division
Johnson Seeto	Director, Marine Institute, University of the South Pacific
Robert Gillet	Project Manager, UNDP

TONGA

Sione Mangisi	Director, Ministry of Fisheries
Taniela Koloa	Principal Fisheries Officer, Ministry of Fisheries
Ulunga Fa'anunu	Head of Aquaculture, Ministry of Fisheries
Naita Manu	Giant Clam Project Leader, Ministry of Fisheries
Tupou Tupou	Fisheries Assistant, Ministry of Fisheries

WESTERN SAMOA

Ueta Fa'asili	Chief Fisheries Officer, Fisheries Division
Leon Zann	Fisheries Resources Advisor, FAO/UNDP
Dan Su'a	Senior Marine Biologist, Fisheries Division
Ameto Kalolo	Fisheries Assistant, Fisheries Division

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