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### Current management policies and problems of the inshore fisheries resources in Vanuatu — Sea cucumbers

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Sea cucumbers, or beche-de-mer, are seen as one of the major cash crops for many of the remote areas in the South Pacific. In Vanuatu, they are an important source of income locally and nationally. The end products are priced very highly in the South-East Asian Market because they are regarded as a delicacy.

The management of this resource has been very poor, as beche-de-mer harvesting is not a tradition in this country, and also because there has been very little scientific information available on which management can be based. The current legislation in Vanuatu concerning the exploitation of this species is based on a quota system. The Ministerial order of 1991 limits the export of dried beche-de-mer to an annual quota system. So far, records of annual exports of dried beche-de-mer from Vanuatu

have been consistently well below the legal quota (Bell & Amos, 1993). This may mean that the quota could be well above the sustainable level of exploitation for the fishery. The reason for the low production could also be that the resource is not large enough to expand to meet the quota, or there is a lack of enthusiasm by the collectors and exporters to expand.

However, the Fisheries Department needs to conduct resource assessment surveys in order to determine appropriate exploitable levels of the stock available. Chambers (1989) recommended that the correct strategy with regard to beche-de-mer harvesting in Vanuatu would be to collect intermittently from sites which are large enough and support sufficient densities of commercial species in order for it them be economical.

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Since no legislation has been effective in controlling the exploitation of this resource, Fisheries Enforcement Officers have so far based their actions on their individual judgement and experience in the field. This approach leads to inconsistency, as there are no written rules on which to base prosecutions. In addition, problems arose when there was a national strike and new employees recruited — it is difficult for them to recognise undersized dried beche-de-mer. Beche-de-mer exporters could export undersized animals, knowing that they could not be prosecuted because there was no legislation by which Fisheries Officers could secure convictions.

Export data are usually given to the Fisheries Department, indicating tonnage collected per given area. However, these do not show which species are more heavily exploited than the others. Fisheries Officers realised that it might not be absolutely necessary to adopt legislation from other member countries, because environmental conditions influ-

encing the growth and survival of sea cucumbers might vary between countries. In addition, concern is also being raised over differences in shrinkage among species, which would of course have an effect on the size limit of the processed animals. It might be necessary to have processing trials on various commercial species to be able to come up with size limits for different species. This could include legislation covering species of commercial importance.

The quality of dried beche-de-mer in the country must also be effectively controlled when competing with the rest of the market in the region. In Vanuatu, especially in the areas where beche-de-mer fishing is most popular, the only means of transport is by boat. And since the sun-dried method is the only method used for processing this resource, organisms such as fungus tend to infest the processed animals, making them unsuitable for sale. In one case, 3.5 tonnes of sun dried beche-de-mer had to be discharged due to fungal infection.

### Status and management of inshore fisheries in the Kingdom of Tonga: Beche-de-mer

*by Ministry of Fisheries*

The fishery began in Tonga in the early 1980s. It is based in the Ha'apai island group with its abundant coral reefs, although product is also harvested from the Vava'u and Tongatapu island groups. The fishery began to develop rapidly after the introduction of assisted underwater breathing apparatus (scuba and hookah) in the late 1980s–early 1990s. Despite an absence of recorded data, it is likely that the fishery peaked in 1994.

After fishers collect the sea cucumbers, they either clean and process them themselves before selling to an exporter, or they sell them fresh to either a middleman or direct to an exporter who cleans and processes them. Generally the fisher is paid between T\$5 and T\$7 [1 T\$ = US\$ 0.75] per plastic bucket for sea cucumbers, regardless of species composition. On occasion, the fisher is paid in the way he prefers—using a sliding fee per animal, depending on the species and size. There are ten registered exporters in Tonga, seven of whom are active.

The Beche-de-mer fishery in Tonga is attractive to fishers, as the animals are easy to collect, dried product keeps without ice, and there is always a market. These features, combined with the 'open-access nature' of Tongan fisheries, are causing a rapid demise in the stocks of sea cucumbers in

Tongan waters. As higher-valued species are becoming less abundant, lower-valued species are being harvested in increasing amounts. Information from the Ministry of Fisheries seven-month-old export fisheries database has supported this observation. This information includes the following:

- ☞ Higher value sea cucumbers are not being collected in increasing amounts. For example, sandfish free-on-board (FOB) value is T\$25.00 but exports have remained static and average 116 kg/month;
- ☞ Higher prices are being paid for less popular species. For example, elephant fish were T\$2.00/kg FOB in November, but now fetch T\$7.00 FOB;
- ☞ The quantities of lower-valued species exported has increased. For example, greenfish was not exported until January 1995 (334 kg), yet by March, 13,025 kg was exported;
- ☞ Despite either stable or increased prices, regularly increasing production has occurred in only three of the 15 species traded, and there are species fetching T\$7.00 or less FOB prices;