

Communications...

Abstract of a degree project thesis sent by Hanna Nilsson

Management strategies in the sea cucumber fishery in Zanzibar, Tanzania

Source: Degree project thesis.

Supervision: Dr. Maricela de la Torre-Castro and Prof. Nils Kautsky, Dept. of Systems Ecology, Stockholm University, Sweden

Sea cucumbers are considered key organisms for functioning ecosystems since they maintain essential ecological functions such as nutrient recycling and bioturbation. They also provide an important source of income for coastal communities. There is a long history of commercial demand, harvest and export of sea cucumbers from the Western Indian Ocean (WIO) to China and other Asian countries. At present, the demand remains high and signs of overexploitation are emerging. However there is little knowledge about sea cucumber biology and ecology and about their socio-economic importance as well as the management practices in the WIO region. To increase the knowledge about these aspects, a three-year project was initiated to study sea cucumber management in Zanzibar, Tanzania. The aim was to investigate the current formal and informal management strategies and to suggest improvements to enhance the sustainability of the sea cucumber fishery on the island. The information was gathered using semi-structured interviews held with resource users and government officials and from acts and policy documents. Formal sea cucumber management in Zanzibar was found to be weak and insufficient. Regulations and license control are highly unclear. No statistical data are gathered on fresh sea cucumber catches; data are gathered only for dried product before export. In addition, no stock assessment is regularly done and no formal monitoring is carried out. A minimum size limit of 10 cm for fresh sea cucumbers exists, but this regulation is not properly enforced. In addition, the informal management strategies seem to be insufficient and cannot maintain the sustainability of the activity. However, a willingness to maintain sustainable harvest levels was detected among both resource users and government officials. This is of great importance for successful management. In light of this willingness, management suggestions were developed based on ideas provided by the resource users and managers. The suggestions are rooted in the actual management organisation and structure in Zanzibar and are strengthened by studies from resource management literature. The proposed ideas may function as an initial step to establish a more comprehensive sea cucumber management plan in Zanzibar and will contribute to the regional studies in WIO.

Abstract of a degree project thesis sent by Caroline Raymond

The structure of the sea cucumber production chain and resource use in Zanzibar, Tanzania

Source: Degree project thesis.

Supervision: Dr. Maricela de la Torre-Castro and Prof. Nils Kautsky, Dept. of Systems Ecology, Stockholm University, Sweden

In the Western Indian Ocean (WIO), sea cucumber fisheries are considered to be an important income source for several coastal communities. However, due to high demand, sea cucumbers suffer from worldwide overexploitation and reduction in populations. This also occurs in the WIO area. The general objective of this study is to map the structure, actors and flows of the sea cucumber fishery in Zanzibar (Unguja Island). The study is based on 100 interviews with actors involved in sea cucumber fishery activities. The results show that the structure of the sea cucumber production chain consist of collectors (fishers), processors (middlemen) and traders (exporters). There are three collection techniques: walking by the shoreline, snorkelling and diving. Often, specialised processors work as intermediaries, acquiring the catch from collectors and selling it to traders who in turn do further processing before exporting to the world market (most commonly to Hong Kong). Both women and men are involved in collection, although women collect only by the shoreline. The collection activity is estimated to involve nearly 800 specialised sea cucumber collectors, and even more people are involved occasionally. However, the average income per day varies considerably between collector groups — a diver earns over TZS 30,000 per collection day, which is ten times more than a shoreline collector. The sea cucumber activity is estimated to generate an accumulated value of TZS 872,000,000 (USD 665,000) yearly for the specialised collectors. Furthermore, 20 species of sea cucumbers are of commercial value in Zanzibar; nearly all are collected by each of the three collector groups. However, the trend is for snorkelers and divers to collect the most valuable species in much higher quantity. The exported amount of beche-de-mer for the year 2007 was estimated to be 56 tonnes. The result indicates that collection of sea cucumbers may be a way to contribute to livelihoods. However, the sustainability of the activity should be carefully addressed.

Communication from Maricela de la Torre-Castro

As part of the project 'Sea cucumbers, a poorly understood but important coastal resource: National and regional analyses to improve management in the Western Indian Ocean (WIO)' (2006–2008), financed by the Marine Science for Management (MASMA) programme, we investigated the sea cucumber fishery system in Zanzibar. This part of the project covered the management, structural and economic issues of the sea cucumber fishery system and constitutes the first systematic study performed in Zanzibar. The main results are presented in the abstract section of this number. We will

continue with stock and biodiversity assessments as well as comparative work to analyse the different management systems in the countries of WIO.

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Communication from Zaidnuddin Ilias

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Observation of the first grow out activities with *Stichopus horrens* juveniles in Malaysia

Stichopus horrens is an important commercialised sea cucumber in Malaysia. It is one of the main ingredients in local traditional medicines. The industry based on *S. horrens* trade supports a large number of individuals and promotes one of the islands (Langkawi) as a centre for production of sea cucumber medicine. Extracts from this species were used widely and known to have antifungal and antibacterial components. Local pharmaceutical companies have also become involved in researching compounds from the sea cucumber extracts.

Due to the increasing use and collection of sea cucumbers, the Department of Fisheries Malaysia started ecological and aquaculture research on this species. Research on aquaculture for this species started as early as 1994 at the Fisheries Research Institute of Malaysia, but recently great progress has been achieved. Two subsequent hatchery spawnings occurred in late 2007 and mid-2008 at the National Prawn Fry Production and Research Centre (NAPFRE), giving us the opportunity to attempt to grow the juveniles. Grow out in the hatchery was very slow, taking 30–40 days for the juveniles to reach approximately 4 cm in length. A trial in a sea cage in November 2008 was more successful. Growth to the same size took only half the number of days with a survival rate of 80 per cent. Further study is being carried out to determine the stocking density and possibility of holding the juveniles until they reach maturity.

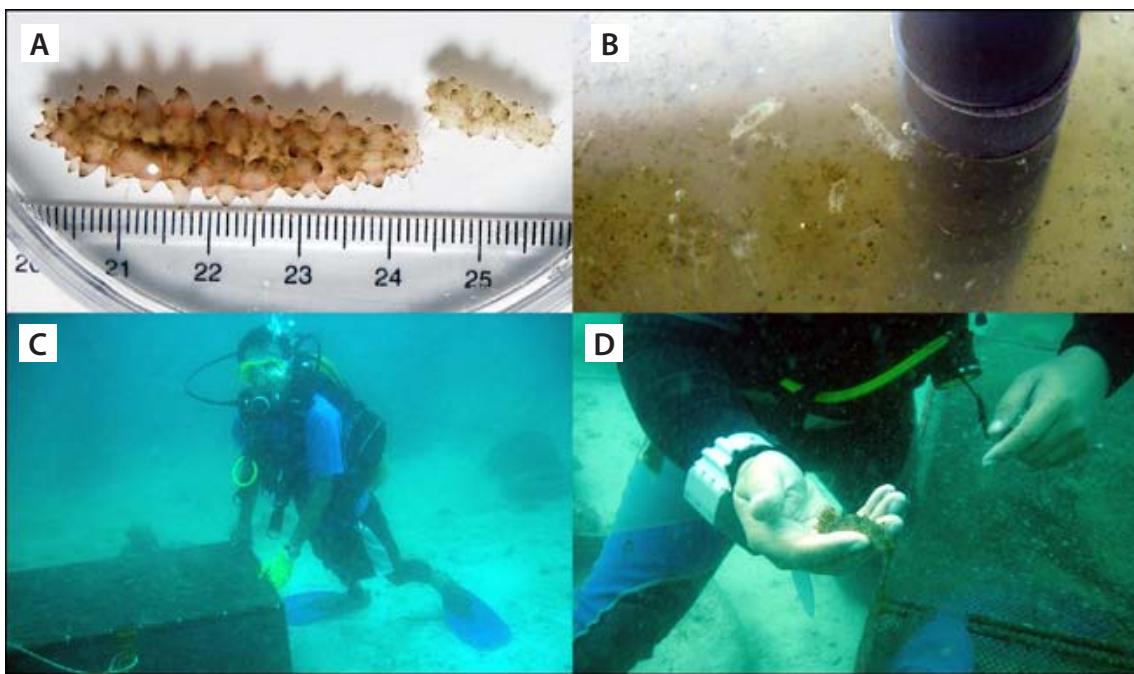


Figure 1. Juveniles reared in hatchery (A); early juveniles (B); diver with experimental cage (C); and juveniles after 20 days in cages (D)

Various news communicated by Poo Sze

Commercial harvest begins Monday for sea cucumbers

Published October 05, 2008, Ketchikan Daily News, <http://www.ketchikandailynews.com>

KETCHIKAN, Alaska — Divers are getting ready for the beginning of the commercial sea cucumber season in southeast Alaska with the lowest quota in several years.

The commercial season starts Monday morning.

Sea cucumbers are also known as sea slugs. They're echinoderms with an elongated body and leathery skin. They're a popular food in Asia. The Alaska Department of Fish and Game set a guideline harvest of just more than 1.1 million pounds for 18 harvest areas.

That's down about 19 per cent from last season and is 24 per cent lower than for the 2005–2006 season. The reason for the drop in the sea cucumber population isn't known. Biologist Marc Pritchett says there's an assumption that it's connected to sea otter predation.

Nukualofa, Tonga

Source: http://www.matangitonga.to/article/tonganews/economy/tonga_sea_cucumber_220908.shtml

After 11 years of closure, Tonga has lifted its ban on the fishing of sea cucumbers but only for six months per year, confirmed the Deputy Director of the Ministry of Fisheries 'Ulunga Fa'anunu today.

The ministry has awarded nine local companies licenses to fish for sea cucumbers in Tongatapu, Vavau and Haapai, and they will be mainly for export to Asian countries such as Hong Kong.

He said the Tonga Cabinet passed a new Fisheries Management (Conservation) regulation in July 2008 lifting the ban on sea cucumber fishing between April and September but keeping the ban for the remaining six months from October 1 to March 31 during the sea cucumber reproduction season.

In 1997 Tonga banned the fishing of sea cucumbers because it was overexploited; this action to protect the species has allowed for the stock to rebuild over the years.

Fa'anunu said that the current status of the Tongan economy was taken into account in the decision to re-open the industry. This activity may help the economy in terms of exports, while the fishery remains closed for part of the year to ensure its sustainability.

Mauritius to control sea cucumber fishing

Port-Louis — 27/08/2008

Port-Louis, Mauritius — The Mauritian Ministry of Agroprocessing and Fisheries will soon enact laws to control sea cucumber fishing, an official source told PANA here. An official from the ministry said on Tuesday evening that the decision was aimed at ensuring a sustainable exploitation of the marine resource.

'Under the regulations, anyone wishing to fish sea cucumbers will have to apply for a written authorisation from the Ministry of Agroprocessing,' he explained.

He added that fishing of sea cucumbers, commonly known as *bambara*, would be banned from 1–31 March each year to enable reproduction of the species.

Sea cucumber is a popular Chinese delicacy named for its cucumber-like shape and believed to be an aphrodisiac. The sea cucumber has an elongated body and leathery skin and is found on the sea floor worldwide.

Feasibility of Pacific oyster and California sea cucumber polyculture

Research team: Chris Pearce Fisheries and Oceans Canada (DFO), Debbie Paltzat University of British Columbia (UBC), Penny Barnes Center for Shellfish Research (CSR), Scott McKinley (UBC). For information contact Chris Pearce, PearceC@pac.dfo-mpo.gc.ca. Submitted by DFO Aquaculture Collaborative Research and Development Program (ACRDP).

Growth and production of California sea cucumbers (*Parastichopus californicus*), co-cultured with suspended Pacific oysters (*Crassostrea gigas*), were investigated in a 12-month study conducted at two deep-water, suspended oyster culture sites in British Columbia. Rates of oyster biodeposition (faeces and pseudofaeces), and the utilisation of this particulate material as a food source by *P. californicus*, were also examined.

Peaks in sedimentation rates (93.6 g dry weight m⁻² day⁻¹) through 8.5 m of water depth were observed in April and July 2004. At the two study sites, maximum mean fluxes of total organic carbon in sediment traps at 8.5 m depth occurred in July 2004 and amounted to 3,123 and 4,150 mg dry weight C m⁻² day⁻¹. Maximum mean fluxes of total nitrogen at the two sites were 633 and 441 mg dry weight N m⁻² day⁻¹ and occurred in July and November 2004, respectively. Mean C/N ratios of particulate material in the sediment trap samples collected at the two sites ranged between 5.93 and 8.39 and may be classified as being of high nutritional value.

Sea cucumbers grown in trays at both sites successfully utilised biodeposits from the cultured oysters and showed a mean weight increase of 42.9 g in approximately 12 months (average growth rates for both sites ranged from 0.061 to 0.158 g day⁻¹). Overall growth was affected by the absence of visceral organs and the cessation of feeding activity in the November 2004 sampling period. Mean values for organic content were significantly higher in the foregut of the sea cucumbers (233.0 mg g dry sediment⁻¹) than in the sediment (64.3 mg g dry sediment⁻¹) or in the hindgut (142.8 mg g dry sediment⁻¹), showing both active selection of organic material from the sediments and digestion/assimilation of these organics in the gut. Organic material deposited in the trays was assimilated by *P. californicus* with an average efficiency of 48.4 per cent.

The successful utilisation of the naturally-available biodeposits from the cultured oysters by sea cucumbers suggest the feasibility of developing a commercial-scale co-culture system that would both reduce the amount of organic deposition underneath shellfish farms and produce a secondary cash crop.