

An Indonesian sea cucumber fishing village: The case of Pulau Misa

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Abstract

Small traditional sea cucumber fishing villages are abundant throughout Indonesia but information about their activity is not always available. Pulau Misa is a small island in eastern Nusa Tenggara whose inhabitants perform one-day trips to capture sea cucumbers by free diving. Processing the animals is done on the island by the women from the community. At least eight species were identified during our visit although most of the animals were already dried, which made identification very difficult. Data about the community's total sea cucumber catches are not available. In Indonesia, the lack of specific management plans along with the difficulty of studying small remote fishing areas may lead to an underestimation of total sea cucumber annual catches. The study of small fisheries like the one at Pulau Misa is crucial for the conservation of natural sea cucumber populations.

Introduction

Sea cucumbers have been fished for more than 500 years in Indonesia, which is currently considered to be the world's main beche-de-mer (or *trepan*) producer and exporter (Conand 1990; Tuwo and Conand 1992; Conand and Byrne 1993; Purcell et al. 2013). Despite this fact, there is no clear sea cucumber management strategy (Choo 2008; Purcell et al. 2013) and many of the traditional fisheries carried out by small communities are not yet well documented. One of the main reasons for this lack of information is the difficulty of studying the fisheries throughout such a vast country of 8.3 million km², 17,508 islands and 81,000 km of coastline (Tuwo 2004). Some of the commercial sea cucumber species exploited in Indonesia are *Actinopyga echinites*, *A. mauritiana*, *A. miliaris*, *Bohadschia argus*, *B. vitiensis*, *Holothuria atra*, *H. edulis*, *H. fuscogilva*, *H. fuscopunctata*, *H. whitmaei*, *H. scabra*, *H. lessoni*, *H. coluber*, *Stichopus chloronotus*, *S. hermanni*, *Thelenota ananas* and *T. anax* (Tuwo 2004). Indonesia's traditional sea cucumber fisheries are essentially carried out by two techniques: 1) with large boats, where approximately 10 fishers stay away for months, capture the animals with the help of diving equipment, process the sea cucumbers aboard and finally sell them in the nearest village; and 2) with small boats, where fishers, usually 2–4, perform one day trips and process the sea cucumbers when they return home (Tuwo and Conand 1992). Although some studies have been carried out in the

field, there is still a lack of information about the current number of active sea cucumber fisheries in the country, where are they based, and what species they focus on. So far, much of the field studies have been focused on the fisheries of Sulawesi Island (Conand and Tuwo 1996; Moore 1998; Massin 1999; Tuwo 1999) and Lombok Island (Purwati 2006) but little is known about fisheries in other areas of Indonesia. The present paper provides information on beche-de-mer activities at Pulau Misa, a small island with a fishing village located between Komodo, Rinca and Flores islands, in the Flores Sea, in eastern Nusa Tenggara, Indonesia (Fig. 1).

The case of Pulau Misa

We visited Pulau Misa in November 2011. The island has approximately 600–800 inhabitants whose main income comes from beche-de-mer (or *trepan* as it is called in Malaysia), although they also fish for abalone (Pet 1997) and lobsters (pers. obs.). The people from Pulau Misa carry out a semi-traditional sea cucumber fishery on small boats, collect the sea cucumbers by free diving and hookah, and process them the same day as they return to the island. The women eviscerate the sea cucumbers, boil them several times, and finally sun-dry them for a couple of days (depending on the moisture content and size of animals, see Fig. 2). In sun-drying, the sea cucumbers are usually covered and filled with salt (Fig. 3). Some large individuals are dried with a wooden stick across the slit to facilitate the drying of

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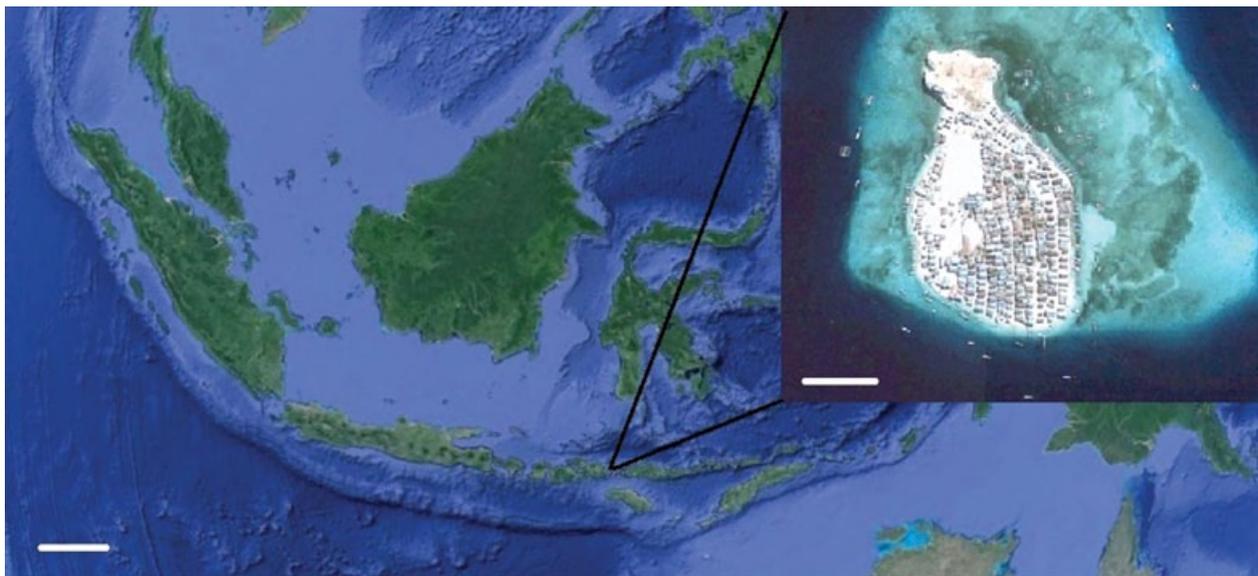


Figure 1. Indonesia and the location of Pulau Misa. Scale bars are 300 km (left) and 100 m (insert map).



Figure 2. Women processing sea cucumbers at Pulau Misa.



Figure 3. Sun-dried individuals of various sea cucumber species.



Figure 4. Size comparison between unprocessed and processed *Stichopus herrmanni*.



Figure 5. Unprocessed individuals of *Stichopus herrmanni* and *Stichopus vastus*.

the interior part of the body. Some species, such as *H. scabra*, *H. sp. aff. arenicola* and *H. sp. aff. notabilis* are peeled with a knife to remove the outer part of the body wall and are later boiled and dried like other sea cucumbers. Although the identification of species becomes particularly difficult once they are processed, with drastic changes to their overall morphology (e.g. size, Fig. 4) we were able to identify

the following species using the method of Purcell et al. (2012): *Stichopus herrmanni* (which was very abundant) (Figs. 4 and 5), *S. vastus*, *Pearsonothuria graeffei*, *Actinopyga lecanora*, *Holothuria pardalis*, *H. whitmaei*, *Bohadschia argus* and *B. marmorata*. In Pulau Misa, all members of the community are involved in the fishery and processing of sea cucumbers. For most of them it constitutes their only source of

income. Future studies should focus on quantifying and identifying the annual catches of Pulau Misa's fishers in order to assess the impact of this fishery on the area, especially taking into account the proximity of Komodo National Park and its unique biodiversity, with more than 1,000 species of fish, 385 species of reef-building corals, 70 species of sponges and 7 species of seagrass (Harvey and Yusamandra 2010).

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