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The Role of Women in the Fishery Sector of Pantar Island, Indonesia

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Abstract

In Indonesia, marine resources make an important contribution to rural local livelihoods for both food security and cash income. Small scale fisheries typically involve men in catching and women in post-harvest, with overlapping roles. Both activities contribute to household livelihoods. The Indonesian fishing sector is seen as a male domain and the contribution of women is poorly recognised. This paper examines the role of women in the small scale fishery sector in Pantar Island, Nusa Tenggara Timur Province, located in the area of the Alor Marine Conservation Plan of the Coral Triangle Initiative. It examines women's participation in pre-production, fishing and seaweed farming activities, and post harvest, including marketing. The data were collected in four communities through focus group discussions with women and men, and key informant interviews with village leaders and fisherwomen. The results provide a local context-specific analysis of the role of women in small scale fisheries, demonstrating that women do fish and participate in a range of fishery related activities which in turn contribute significantly to household food security and income and are an important, but frequently overlooked, stakeholder group in the small scale fishery sector. Women must be included in future conservation and fishery planning.

Introduction

In the developing world, women living in coastal areas participate in many different ways in the small scale fisheries sector – as gleaners, fishers, traders, fish farmers and processors (Weeratunge et al. 2010; Arenas and Lentisco, 2011). Paid and unpaid, their employment contributes to the individual, household and community at many different levels such as for food, income, and in cultural traditions (Weeratunge et al. 2010).

Although the involvement of women in the fisheries sector has been recognised globally (Williams, 2008), more remains to be done to recognise and understand women's work in the sector (Weeratunge et al. 2010). The Food and Agriculture Organization of the United Nations (FAO) has set targets to mainstream gender equity in their global fisheries and aquaculture programmes by 2013.[1] In some countries, increasing recognition of the often overlooked role of women in the small scale fisheries sector is gaining momentum such as through organisational movements of fisherwomen in Brazil, Thailand, Chile and Tanzania advocating their rights to access fish resources (Sharma, 2010). However the lack of gender disaggregated data on fishers globally has hindered the

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[1] http://www.fao.org/gender/gender-home/gender-programme/gender-equity/en/, Accessed 30 August 2011

recognition of the role and "invisible" work of women in the fisheries and fisheries production sector (Choo et al. 2008; Williams, 2010). This is especially relevant in countries like Indonesia, and most especially in remote island communities.

Gender and Fisheries in Indonesia

Indonesia is an archipelagic nation that covers 5.8 million km^2 of marine area and has approximately 17,504 islands, a coast line of 95,181 km (Ministry of Marine Affairs and Fisheries, 2009a) and 8,090 coastal villages (Ministry of Marine Affairs and Fisheries, 2009b). Millions of Indonesia's poor belong to small scale coastal fishing households in the eastern region of Indonesia and are heavily reliant on fish for daily food and to generate income to meet daily living costs as well as other basic needs such as education. Per capita fish consumption of capture fish across Indonesia in 2007 was about 25 kg (FAO, 2010). In many eastern Indonesian coastal communities, average consumption is certainly higher.

Coastal fishing households include a large but unknown number of women who are engaged in fisheries activities using small capital commitments and simple technology (such as hand lines and canoes) to harvest and catch marine resources. They also play an important role in processing or selling fish catches (Salagrama and Salka, 2010). The Coral Triangle Initiative (CTI) on Coral Reefs, Fisheries and Food Security, a six country conservation effort (Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands, and Timor Leste), identified the Indonesian small scale sector as a strategic sector to alleviate poverty, improve food security and improve livelihoods, especially for women (Coral Triangle Initiative, 2009).

Women in coastal villages are usually identified by the government as fishermen's wives and their work is considered part of the domestic work of caring for families (Parawansa, 2002) and households, such as reproduction, fetching water, firewood, preparing food and house cleaning (Momsen, 2004). Due to this classification, the work of women in fisheries is not counted in national government census collections under fisheries related employment at district administrative level. For example, the Indonesian Statistics Bureau (BPS) collects and produces fisheries related data for each province, regency and sub-district on the number of (male) fishers employed in the fishery sector either on full time, part time major or part time minor basis (e.g., statistics for Alor, Nusa Tenggara Timur Province, which contains the Pantar Islands) (Table 1). BPS Indonesia classifies fishers based on the amount of time spent fishing: (i) full time fishers who spend all of their working time fishing; (ii) part time (major) fishers who spend the majority of their working time fishing but may have other work activities; and (iii) part time (minor) fishers who spend a minor part of their working time fishing. Information is also collected on the gear used (such as types of boats, canoes, motorised, non-motorised) by household, the species caught, and the total fish production (BPS Kabupaten Alor, 2009).

In the Indonesian Fisheries Law No 31/2004 (and amendments thereafter) "fishers" are called *nelayan* in Indonesian which although does not have a gender associated with it, is usually translated as "fishermen", defined specifically in the law as "a person whose way of living is catching fish" (Law No 31/2004 Article 1, subsection 10). The work conducted by women in the fishery sector comes under the definition of a "fishery" under the Republic of Indonesian Law No 45/2009 (amendment to Law No 31/2004 on Fisheries) article 1, subsection 1. Fishery is defined as "an activity related with the management and utilisation of fish resources and its environment from pre-production, production and processing up to its marketing performed in a fishery business system" (http://faolex.fao.org/docs/pdf/ins97600.pdf, accessed on 09 September 2011).

Table 1. Number of fishers (male) in Alor and Nusa Tenggara Timur Province, Indonesia in 2009.

Type of fishers	Indonesia	NusaTenggaraTimurProvince	Alor Regency*
Full-time fishers	1,096,289	21,698	8,178
Mainly part-time fishers	762,997	32,863	4,080
Part-time fishers as additional work	309,993	11,565	2,805
Total	2,169,279	66,126	15,063

Source: The Ministry of Marine Affairs and Fisheries, 2009.

* Adrianto et al. 2010 reports on the type of fishers from Alor regency in which Pantar Island is located.

Because the activities of women in fishing households are considered domestic work, women are generally not involved in activities in the public domain. For example, women have been left out of decision making regarding village development plans in the coastal villages in South Sulawesi (Koban et al. 2011), and discussions about marine resource management in other regions (Novaczek et al. 2001; Balai Taman Nasional Wakatobi dan Pemerintah Kabupaten Wakatobi, 2006; Adrianto et al. 2010).

The present paper aims to provide a local context-specific analysis of the role of women in fisheries in a rural coastal community in eastern Indonesia with a case study of selected communities from Pantar Island in the province of Nusa Tenggara Timur. It examines their involvement and role in fisheries activities in pre-production, production (the gear used and products fished), post harvest and market chains. The results demonstrate women do fish and participate in a range of fishery related activities which contribute significantly to household food security and income and other household needs. In this region, little is known about the maritime livelihoods of communities. While the results relate to a coastal mixed ethnic population in the eastern islands of Indonesia, this community is reflective of other such coastal communities.

Location and people

Pantar Island is situated between Alor and Lembata Islands in Nusa Tenggara Timur Province of Indonesia (Fig. 1). Pantar Island is 728 km^2 while the areas of small surrounding islands vary in size (BPS, 2004). The area was recently included in the Alor Marine Conservation Plan which includes the Pantar and Alor Straits designated by the District local government in March 2009, under the CTI.

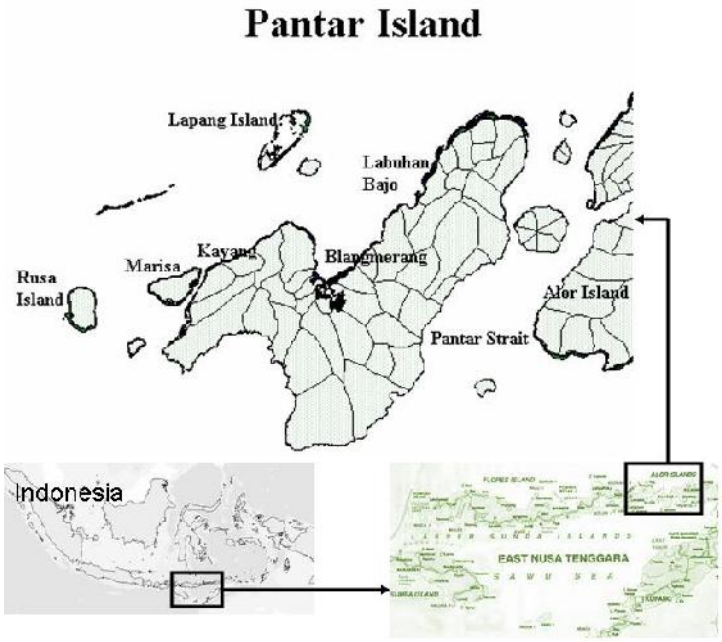

Fig. 1. Indonesia, East Nusa Tenggara and Pantar Island group.
(Source of Pantar Island map: Bakorsurtanal 2007)

The total population of Pantar was 42,100 people in 2008, including those on offshore islands (BPS Kabupaten Alor, 2009). Pantar Island has 38 coastal villages (BPS Kabupaten Alor, 2008) of which just under half are dependent on marine resources as their main source of livelihood or, if inhabitants in inland villages, as food fish. Approximately 15,000 fishers are reported to live in Alor Regency in which Pantar Island is located (Adrianto et al. 2010, and Table 1), but specific information on fishers residing in Pantar Island is not available. Pantar is located in one of the poorest provinces of Indonesia, Nusa Tenggara Timor (NTT), with approximately 30% of people living below the poverty line. Pantar Province was ranked 31st out of 33 provinces in terms of the Human Development Index (HDI) (http://www.bps.go.id/tab_sub/view.php?tabel=1&daftar=1&id_subyek=26&notab=2, accessed 14 July 2011).

Four locations were selected as case-study sites: Labuhan Bajo, Blangmerang, Kayang and Marisa villages (the last three are *desa*'s – rural villages - under the Indonesian government

administrative system and Labuhan Bajo is a hamlet of Kabir *desa*). Labuhan Bajo is located in Pantar sub-district (Kecamatan), Blangmerang is part of Pantar West sub-district, Kayang and Marisa Villages are in Pantar Northwest sub-district. The four locations were selected because their populations represented communities highly dependant on marine resources and were the main users of the surrounding waters where a marine conservation area was established in 2009. In 2009, the population of these four villages was 4,160 people, with the proportion of women in these four villages approximately 53% (Table 2). Women comprised between 48% of total population (Labuhan Bajo hamlet) to 60% (Marisa). The average number of people in a household was five in Labuhan Bajo, Kayang and Marisa Villages, and seven in Blangmerang. However, some Marisa households contained 2-3 families living in one house and these communities are often highly mobile, moving between settlements within Pantar and beyond.

Table 2. The demographic characteristics of four locations in Pantar.

	Labuhan Bajo hamlet	**Blangmerang village**	**Kayang village**	**Marisa village**
Administration	Part of Kabir village, sub district of Pantar	Sub-district of West Pantar (*Pantar Barat*)	Sub-district of Northwest Pantar (*Pantar Barat Laut*)	Sub-district of Northwest Pantar (*Pantar Barat Laut*)
Popunlatio*	1,017 (December 2009)	1,498 (August 2008)	717 (December 2009)	937 (December 2009)
Number of women	489	779	409	563
% of women *	48%	52%	57%	60%
Number of households*	239	224	158	189
Main ethnic group	Sama Bajau	Alorese	Alorese	Alorese
	-Sama Bajau	-Alor	-Alor	-Alor
Languages spoken	-Indonesian	-Indonesian	-Indonesian	-Indonesian

* Source is from village leaders' record.

Most of the occupants of Labuan Bajo belong to the Sama-Bajau ethno-linguistic group, the most mobile and specialised of all seafaring groups in Indonesia, and commonly referred as "sea nomads" (Stacey, 2007). The number of ethnic Bajo in Indonesia is estimated to be between 90,000–150,000. The majority of Sama-Bajau Bajo live in settlements in areas with high marine biodiversity, in particular, Sulawesi, and provinces of West and East Nusa Tenggara, and they are generally landless (Stacey et al. 2012). The population of Blangmerang, Kayang and Marisa villages belongs to the Alorese ethno-linguistic group. Indonesian language is also spoken in these areas and is the main language in trade.

These ethno-linguistic coastal populations are engaged in multiple livelihood strategies. Broadly the people and villages are categorised as (a) full time fishermen and/or heavily reliant on marine-based resources for food and income; or (b) part-time fishing communities (mixed-fishing/agriculture/other). Among these two groups are (a) long established local coastal populations with "clear claims to tenure" (such as the Alorese) and (b) migrant fishing populations, who are either long-term (fishers and families) or seasonal migrants most commonly belonging to the "Bugis-Buton-Makassar-Sama-Bajau" maritime populations of eastern Indonesia (Fox et al. 2009). The economic activities of the populations of the four villages include small scale fishing, gleaning and trading in daily food supplies through village kiosks. However, people in Blangmerang, Kayang and Marisa also own agricultural plots where they grow cassava and corn. The harvest normally provides domestic supply for households for a year. A small number of households in Blangmerang also grow cashews but the earnings are smaller than fishing. Other female income generating activities include textile weaving by women in Kayang and Blangmerang villages and local cash trade in tamarind (peeled and dried) by women from Blangmerang and Labuhan Bajo.

Study Methods

We used a gender division of labour approach to highlight the "invisible" work of women in fisheries and production and marketing and the links between women resource users and their lack of participation in marine or fisheries management (Choo et al. 2008). The gendered division of labour is a key concept for understanding the processes on the form of women's and men's economic activity in the fishery sector (Harrison, 2000). It refers to actual activities, the relationship between both women and men in society, and the interdependency between fishermen and women traders.

The data for this paper were collected by the lead author through focus group discussions, open forum feedback sessions and interviews with selected participants in the four communities. The data were collected over three periods: June to August 2008, November 2009 to January 2010, and June and July 2010. These visits allowed fishing activities to be observed during the east and west monsoon seasons.

Across the four locations, 164 adult women and 152 adult men, all of whom were married, attended a series of focus group discussions (FGD) and open feedback sessions (Table 3). Participants were identified for the meetings either by the lead researcher or they nominated themselves on hearing announcements broadcast through the mosque. The meetings were held outside, in informal settings, i.e., in locations where women normally gather to work together, to make the participants feel comfortable enough to engage in a dynamic discussion (Liamputtong, 2009). Each meeting took 2-3 hrs. The format for the first three FGDs consisted of introductions by the lead researcher and discussion around several guiding topics relating to fisheries and the fishery sector. Topics included marine resource use, species sought and gear used; time spent conducting activities; daily household expenses, incomes and contributions from fishery related activities to

households (food and income). The format of a further two FGDs focused more on post harvest and marketing activities. These meetings were attended by much larger numbers of people, especially in Marisa village. The lead researcher applied a number of methods to ensure that the information gathered during the FGDs was objective and representative of the livelihood activities of the population in each location. In cases where a few participants were less inclined to contribute, the lead researcher approached the reluctant participants later to discover whether they did agree or not with the outcomes of the discussions and, if the latter case, seek further information to raise in follow up group discussions. The facilitator adopted a neutral role.

Table 3. Number of men and women involved in FGDs and feedback sessions.

Period of FGD	Group discussions	Villages							
		LabuhanBajau		Blangmerang		Kayang		Marisa	
		F	M	F	M	F	M	F	M
June-	FGD 1	7	5	14	5	7	8	15	12
August	FGD 2	5	12	6	5	8	-	17	-
2008	FGD 3	5	5	-	-	4	-	-	-
Nov 2009-	FGD 4	10	-	5	6	10	8	30	16
Jan 2010	FGD 5	-	-	3	-	-	-	5	-
Jun-July 2010	Feedback sessions	3	23	9	9	2	10	3	28
Total		30	45	37	25	31	26	70	56

Note: F= Female participants; M= Male participants; FGD= Focus group discussion

Participatory Rural Appraisal (PRA) (Pretty et al. 1995) methods were used also during some of the FGDs. These included actor analysis, village maps, resource use mapping, pie charts of time and seasonality relating to economic activities. These FGDs were complemented with key informant discussions with between 8-10 other women and men (either identified by members of the FGD for their local knowledge and/or seniority and experience in the fishery sector activities) to clarify and cross check the information gathered during the FGD. The first author also observed a broad spectrum of fishing activities in different seasons.

Results

We documented the many ways women and men were involved in the fisheries sector in Pantar from pre-production; in the production stage through catching and collecting fish and invertebrates, and in post production.

The pre-production stage

At the pre-production stage, women from all four villages were involved in preparing fishing equipment such as lines, bait, hooks and nets for their own fishing activities in the intertidal areas. For example, older women (grandmothers) in Labuhan Bajo collected sea worms in mangroves to use as bait for hand-line fishing along the coast for 1 hr day^{-1} during low tide. Women in Labuhan

Bajo also helped their husbands, unmarried brothers or fathers in repairing cast nets. Women in Marisa prepared their own lines and hooks and paddled dugout canoes to fish in the waters close to their village. Women in Kayang and Marisa maintained their own fishing gear.

The production stage

The fishing activities of women were conducted in mangrove areas, intertidal areas and inshore coastal waters out to approximately 2.5 km. In the production stage, women from all four villages caught fish and collected invertebrates in the intertidal areas using several methods (Table 4). Women gleaned shells and *trepang* (Holothuria), while some men from each village were also involved in this activity. The shells commonly collected by women were turban shells, mud creepers, oysters, clams, cockles, and bivalves (Table 4) as well as juvenile fish (such as groupers (*Epinephelus spp)*, soldierfish (family *Holocentridae*), fusilier fish (family *Caesionidae*), and surgeonfish (family *Acanthuridae*). Spider conch (*Lambis spp*) was mostly collected by men. The women in Marisa and Blangmerang villages collected shells in the mangrove areas using sticks or by hand. Only women from Labuhan Bajo collected edible sea urchins (*Trineustes gratilla*) for domestic consumption from the intertidal areas in front of their villages. Women did not free dive to collect top shells (*Tectus niloticus*).

Table 4. List of the most common marine products collected in four villages in Pantar Island collected over one year.

Marine products	Women	Men
Shells*	Y	Some
Juvenile fish	Y	Y
Demersal fish	Y	Y
Sea urchin	Y	N
Trepang	Y	Y
Topshells	N	Y
Pelagic fish	N	Y

Note: *shells cover turban shells, mud creepers, oysters, clams, cockles, spider conch, and *Anadara sp.*
Not all products are collected every day of the year.

Almost all women in the four villages used fish traps (*ker*) which were not used by men. Fish traps were positioned in front of rocky sea bottom or coral reef areas. Women banged sticks on the surface of the water or stirred up the sea with their hands to scare fish towards the traps. Based on FGDs, all women in the four villages spent on average at least 3 hr day^{-1} gleaning for shells and catching fish using fish traps during low tide in almost all seasons, depending on weather conditions and when they were not preparing fish to be taken to market. During low tide in all seasons, women collected shells, sea urchins and *trepang* and catching fish using *ker.*

In inshore waters using handlines from outrigger canoes, most women in Labuhan Bajo hamlet, Blangmerang and Marisa villages caught various species of demersal fish (such as trevally) (Table 5). Meanwhile, women in Kayang village caught fish when other protein sources were not available or they had no cash to buy food. The women of Labuhan Bajo hamlet and Blangmerang village spent at least 3 hr day^{-1} on average fishing by hand lines. This included preparing the bait and returning home. However women from Marisa village spent up to 8 hr trip^{-1} catching fish in Rusa Island which is located 10 km from their village. These activities were conducted mainly when other sources of protein were not available or when nothing was available to be bartered for food.

Table 5. List of fishing methods used by men and women in four villages in Pantar Island.

Fishing methods	Women	Men
Shell collection (gleaning)	Y	Y
Fish trap (*ker)*	Y	N
Handline from canoe	Y	Y
Cast net from the shore	Y	Y
Cast net with outrigger canoe	Y	Y
Handline from outrigger canoe (out board engine power <7hp)	N	Y
Spear gun	N	Y
Cast net with motor boat	N	Y
Mid water trawl (*lempara*)	N	Y
Drift/bottom longline (*jala*)	N	Y
Kite fishing from motor boat	N	Y
Shark net	N	Y
Free dive	N	Y
Dynamite fishing	N	Y

Y= Yes; N=No

Several women in Kabir used cast nets from the shore while a small number of women from Blangmerang used cast nets from outrigger canoes. Women were not involved in catching pelagic fish (Table 5). Pelagic fishing was normally conducted by men from the late evening until dawn or by mid-water trawl from vessels crewed by men from Blangmerang and Labuhan Bajo. Pelagic fish were abundant during the west monsoon, from December to April.

All villages also farmed seaweed. The women's activities included preparing materials and the area for seaweed farming, tying the seedlings to ropes, daily maintenance, collecting seaweed dislodged onto the seabed and harvesting and drying the seaweed. Those activities were conducted together with other members of the family, such as husbands or children. However, the men were normally responsible for transporting the sacks of sundried seaweed to local buyers. During the seaweed season, Blangmerang villagers spent the most time, approximately 15 hr day^{-1}, on seaweed farming in Lapang Island. The women in Kayang also allocated 4 hr day^{-1} for seaweed farming

almost year round. When they cleaned the rope or retied the seaweed, they also opportunistically collected shells or *trepang*.

Women's fishing activities were influenced by the east and west monsoons. For example, small pelagic fish such as halfbeaks *(Hyporhamphus dussumieri)*, round scad (*Decapterus spp*), and bigeye scads (*Selar chrumenopthalmus)* were abundant during the west monsoon. During the east monsoon, demersal reef fish were commonly caught and sold fresh at the local village markets. In the intertidal and mangrove areas, women collected shells year round.

The post harvesting stage

Women's post harvest activities were centered on the processing and sale of pelagic and reef fish and the meat of mussels. They served and used the small weekly markets of their own villages, as well as a weekly market in Bakalang market in the north of Pantar Island, and markets on neighbouring islands in Nusa Tenggara Timur (NTT). Weiriang market in neighbouring Lembata Island was reached by regular inter island wooden ferry. For purchases, this market was a favorite for Pantarese as the products were cheaper than in the Pantar town market and in Kalabahi, the capital city of Alor District. Some fish products from Pantar were also sold in Atapupu market on Timor Island.

The post-harvest stage commenced when a canoe or motorised boat crew returned from a fishing trip. The local traders, who were mostly women (called *papalele* in local language), approached the boat as it docked on the shore to bargain with the captain, crew and/or owner of the fishing equipment or boat on price. For example, with a mid-water trawl fishing operation for pelagic fish (such as long tom (*Tylosurus crocodilus)* and halfbeaks), women traders bargained with the owner of the boat. For small boats using hand lines or cast nets (for yellowfin tuna, *Thunnus albacores,* round scad and *Euthynnus affinis*), the traders bargained with the wives of the fishermen. Once a price was agreed, the women traders collected the fish in baskets.

The method of processing depended on the species of fish, the season, and the time the fish were landed. For example, during the west monsoon (December-February) in 2009-2010, a group of women traders in Labuhan Bajo hamlet purchased hundreds of pelagic fish (e.g. halfbeaks, round scad and bigeye scads) from a boat and processed the fish with salt over 2 hr. The round scad and bigeye scads were abundant during the west monsoon, but options to process them were limited due to limited availability of ice and salt. Ice was only available in Blangmerang and Labuhan Bajo Village, while salt was in limited and irregular supply.

In the case of a mid-water trawl boat landing thousands of halfbeak fish purchased by women from Labuan Bajo, some of the catch was sold directly by the roadside in their village or sold door to door on foot (over a 3 hr period) or in nearby Kabir market early the following morning. A portion of the catch was also sundried for at least 2 days and later sold in another market

(Weiriang or Bakalang Market). Women traders in Labuhan Bajo could spend up to 12 hr to buy, process and sell the catch.

During the market day, women traders in Blangmerang village spent up to 10 hr buying the catch (e.g. round scad and bigeye scad) from boats, processing, and transporting fish to the nearest markets, such as in Weiriang (4 hr away by wooden boat) or in Wolu village (3 hr away by motorbike), to sell it.

In Kayang and Marisa villages, the fish caught by hand line were commonly sun dried by the wives of the fishermen, taking about 4 hr day^{-1} of labour. Once dried, the fish were sold to local village kiosks that also sold daily items such as spices, eggs, snacks, salt, cigarettes, fishing lines and hooks. In return, the women and their families obtained cash or goods on credit. The local kiosk owner then sold the sun dried fish at the nearest market such as Weiriang, Wolu and Kalabahi, taking up to 6 hr in travelling time.

Once a week in each of the four villages, most of the women engaged in the fish value chain spent more than 50% of their day at a local market. The time included preparing the fish for sale, transporting it to the market, selling or bartering the fish in the market and returning home. The number of hours these activities took varied depending on the catch and distance to market but could take up to 7-14 hrs.

The results of the FGDs indicated that across the 4 villages, women spent between 40-50% of their time engaged in fishing and fishing related activities.

The purposes of fishing for women

In the four villages, marine products were collected and caught by women for household food consumption and cash income. The fish caught by trap, hand line and gleaning were mostly consumed within the household and extended family. Excess catch were sold for cash or bartered with inland or "mountain people" for other foodstuffs. For example, in Kayang village, sun-dried fish was bartered for locally grown corn, cassava, vegetables and fruits. These foods were consumed daily by household members and sometimes stored for later use to supplement the household diet when fish was scarce.

The cash income from fish trade was used to support the family's daily expenses and for savings. One woman trader in Labuhan Bajo hamlet explained how employment in fish trading over nine years had brought prosperity to her family. She had repaired the family house, paid for her children to go to high school, saved cash, and bought a number of items of jewellery as a form of savings. Her income had generally been higher than that of her husband. The most regular income for fisher households (households comprised of both women and men who were engaged in fishery activities) was from the sale of fresh and sun dried pelagic and demersal fish, and the meat of

shellfish, top shells and *trepang*. Top shells and *trepang* were not a regular source of cash income as their availability was not guaranteed, but, when harvested, provided significant one-off cash income. Three examples from three women in Labuhan Bajo hamlet, Blangmerang and Marisa villages illustrate how fishing and trading contributed to household livelihoods.

MW was a Sama-Bajau from Labuan Bajo, who generally crewed on a mid- water trawl boat, but also caught yellowfin tuna by kite fishing from a motor boat during the west monsoon and reef fish by handlines from a motorised boat during the east monsoon. He stated he could earn approximately US$3,075 (Rp 24,600,000) per year. His wife, a fish trader, estimated her earning around US$2,584 (Rp 20,670,000) over the same period, comprising US$2,219 (Rp 17,750,000) from fish trading and US$365 (Rp 2,920,000) from cake selling. This household earned approximately US$5,659 (Rp 45,270,000). Participants in the FGD in Labuhan Bajo reported that a household needed at least US$ 3,796 (Rp 30,367,667) annually to fulfil daily needs, for education, and to participate in annual feasts.

SK was a fisher from Blangmerang village. He caught fish (round scad, big eye scad) using a cast net and a motorised boat during the west monsoon. He also dived to collect *trepang,* top shells, nautilus and other shells. His earnings were approximately US$1,305 (Rp 10,440,000) per year while his *papalele* wife earned about the same as MW's wife in Labuhan Bajo, US$2,219 (Rp 17,750,000) per year. They also farmed cashew nuts and corn, but their cash earnings from these were very low. This household earned around US$3,529 (Rp 28,232,000) per year. Participants in the Blangmerang village FGD indicated that a household required at least US$2,721 (Rp 21,765, 000) for annual living expenses.

AM was a fisherman from Kayang village. He used hand and line fishing method from a canoe to catch coral trout, skipjack tuna, grouper and trevally year round. He earned US$1,313 (Rp 10,506,667) per year from fishing. His wife was not a trader but she processed the fish he caught and bartered it for food with the mountain villagers or the owners of the kiosks in their village for daily food and household items. They owned 0.5 ha of land for growing corn. During the Kayang village FGD, participants estimated that one household needed at least US$2,626 (Rp 21,009,667) per year.

The earnings from fish caught by the men as well as from fish traded by the women varied depending on the season. However, from these three examples, we note that the earnings from *papalele* fish traders were a major contribution to their households. In addition, the work of women in fisheries also supported the household for daily food necessities and goods through barter and exchange.

Discussion

This paper highlights the roles, involvement and contributions of women in fishing activities and household livelihoods in the fishery sector of Pantar Island in eastern Indonesia and complements other such studies. As in Pantar, women play a significant role in fishing and in the post-harvest activities and selling of fish in East Kalimantan (Susanto et al. 2005), North Java (Fauzi and Anna, 2010), Sulawesi (Broch, 1981; Gaynor, 2010), Maluku (Soselisa, 1998; Novaczek et al. 2001), and Nias-West Sumatra (Salagrama and Salka, 2010). Our results, however, contrast with those from recent research by Adrianto et al. (2010) who reported that women in the Alor Regency, which includes Pantar, were involved in pre and post-harvest fishery operations such as drying and salting fish, and as retailers or merchants, and in seaweed farming, but they did not acknowledge the role of women in actual fish catching.

In the production stage, women normally fished close to their home villages during the day time. However, we found that women did fish further than the intertidal areas if they had access to motorised boats and the requisite fishing knowledge that enabled them to carry out day trips. Currently, most only had access to non-motorised boats although the households often have a motorised boat. Some women in Marisa said that having access to a motorised boat would help also for transporting water for household purposes.

Trading of fish and the actual fishing activities were interrelated, and women played a dominant role in fish processing and distribution. Women participated in selling either in the village or more distant markets. Women traders processed marine products based on local market demand (for example, inland communities prefer either sun dried or salted fish) and the availability of materials (such as ice or salt). They can be considered the entrepreneurs of the village and are able to respond to consumer demand (Allen and Truman, 1993; Overa, 2003). To sell fish, they managed to overcome challenges such as poor roads, long distances, and lack of regular ice and salt supplies, and infrastructure and service shortcomings.

As indicated by the amount of time spent, fishing related activities dominated people's daily routines. Our research illustrates how women as well as men invested their time in fishing activities and contributed to household food needs and earnings. In 2005 in Nusa Tenggara Timur Province, protein from fish contributed almost 20% of total protein consumed (BPS NTT, 1996-2005) compared to 14.1% for Indonesia (BPS, 2010). This figure is likely to be even higher in the Pantar coastal communities, especially the Sama-Bajau communities who have no access to land and are highly dependant on marine resources (Stacey, 2007).

Recognising the key stakeholder groups and facilitating their participation in decision making processes are critical to effective fisheries resource management (Pomeroy and Douvere,

2008). As Williams (2008) suggests applying a gender lens in the fisheries sector – that is with a "deliberate focus on gender, and age differentiation of roles, responsibilities, access and opportunities" provides a more complete view of the entire fishery and fishery industry, and can lead to appropriate management action. Women should be included in resource management planning because they have knowledge to contribute. Also, they should not be disadvantaged in management plans and strategies, such as having to walk greater distances to access reef resources where no-take areas are established. In addition, they must be recognised in the distribution of benefits. A study in the Roviana Lagoon, Solomon Islands showed that involving women and incorporating their knowledge with western fisheries management knowledge has been integral to a successful programme for monitoring and managing invertebrates (Aswani and Weiant, 2004). A first step to including women is to identify activities which are conducted by women in order to enable women to participate appropriately in marine resource management. This is especially pertinent in Pantar Island where the Alor Conservation Area has been recently declared and a management plan will be developed. Adrianto et al. (2010) noted that the rights of women in Alor District to access fisheries and marine resources were low. In addition, they noted that women were also generally unable to access training provided by government and non-government organisations. Under the CTI, any future efforts to manage this area in Pantar should involve women in coastal communities.

Conclusion

This paper has examined the role of women in fisheries activities in pre-production, production, post harvest, and marketing in four coastal communities of Pantar Island in eastern Indonesia. To date, fishery related employment data by women are not recognised in national government statistical census collections and studies leading to conservation and management plans. Our results demonstrate that women are key economic actors in small scale fisheries in Pantar Island and one of the key stakeholder groups in coastal resource management and conservation initiatives. This is particularly important for Pantar Island and its surrounding designated Marine Park. Better understanding of the gender division of labour, will improve accounting of women's participation in the Indonesian fishery sector and should lead to their interests being taken fully into account. As the fishery sector is a major economic and social sector, and particularly important in remote communities such as Pantar, better gender accounts in fishing will, in turn, help inform better gender policies in Indonesia.

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