# Study on the Post-tsunami Rehabilitation of Fishing Communities and Fisheries-based Livelihoods in Indonesia

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# 1 Introduction

The tsunami trigged by a massive earthquake offshore the west coast of Aceh on December 26th 2004, caused enormous damage to almost the entire coastal area of the province of Nanggroe Aceh Darussalam as Aceh is formally known. The tsunami also affected some coastal areas in the neighbouring province of North Sumatra, predominantly the island of Nias. The latter was hit by a second strong earthquake in March 2005, which caused even more damage to the island. However, given the extent of damage and rehabilitation work going on in Aceh, the focus of this study will be on the interventions in the coastal areas of Aceh. Although some data will be provided on Nias as well, the island was not visited for this study.

The objectives of this study as defined in the terms of reference prepared by ICSF are[1]:

- Provide an overview of major interventions related to rehabilitation of fisheries-based livelihoods and analyze some of the key issues and challenges arising form their design and possible impact on fisheries resources and fishing communities
- Provide an overview of shelter and reconstruction interventions specific to fishing communities and discuss their merits and demerits

The information presented in this study was collected during the months of October and November and is based on both primary and secondary sources. Visits were paid to Banda Aceh and other affected areas along the east and west coast of Aceh province, more specifically the districts of Aceh Barat (Meulaboh) and Aceh Jaya (Calang and Lamno) on the east coast and the districts of Pidie and Bireuen on the west coast.

The interviewed resource persons include government officials, international donor agencies, local NGOs and network organisations and a broad group of representatives of the fishing communities, among others traditional fishers leaders, fishers, boat builders, fish-processors and traders (both male and female). A list of persons met is given in Annex 2. The secondary sources consist mostly of government statistics and policy papers and assessment studies on fisheries from FAO as well as general assessments and appraisal reports regarding the reconstruction and rehabilitation process from various agencies. Where used in this study they are referred to in footnotes. An overview of key documents will be given in Annex 3.

[1] See Annex 1 for ICSF TOR

# 2 The Context

Marine fisheries in the Indonesian province of Nanggroe Aceh Darussalam are predominantly small-scale and traditional, both on the east and west coast. According to Department of Fisheries statistics the provincial marine capture in 2003 totalled a little more than 134,000 tons, with a value of Rp. 863 billion ($ 86 million)[2], accounting for 3 percent of the provincial GP.

Most of the catch is sold fresh for local consumption, either at the immediate local market or in larger towns such as Banda Aceh and Medan, the provincial capital of North Sumatra. A small portion of the catch is being exported to markets in neighbouring Malaysia and Singapore, depending on species and quality. The export is handled exclusively by traders in Medan, who have long-established marketing channels with neighbouring countries and have direct transport links both through Medan's international airport and its Belawan port. Marketing of processed fish, both salted and dried, is also dominated by Medan traders.

Statistics put the total number of fishers in Aceh in 2003 at close to 88,000 of which 53,000 were full-time and around 34,000 part-time. The 60,000 fishers on Aceh's north-east coast outnumber by far the fishers on the west coast. The same holds for the fishing fleet, although less pronounced, with 13,000 out of 23,000 boats belonging to the north-east coast. The fishing fleet consists mostly of wooden boats with a length between 4 and 24 meters, of which 9,000 are without engine, around 4,500 equipped with an outboard engine and another 10,000 with an inboard diesel engine.[3] On the east coast the bulk of vessels are less then ten metres long, with the most popular class of 7.5 metres with 12-23 hp diesel engines. These vessels use trammel nets for shrimp, gillnets for fish and bottom setting long lines for the larger species. In addition there is a class of small purse seiners of 20-25 metres fishing for small pelagics. On the west coast the vessels are of the same type but generally larger. Most boats operate in coastal waters, making day (or night) trips. Only the purse seiners make extended trips, staying up to two weeks at sea. Few locally registered vessels are active in deep sea fishing. Trawling has been officially banned in Indonesia, but that doesn't prevent some foreign trawlers vessels to operate illegally in Indonesia's territorial waters.[4]

Compared to Aceh the capture fishery sector in Nias is far smaller and less developed. Government statistics put the total number of fishers at 6,000, with more than 4,600 working full-time and around 1,350 registered as part-time fishers. The fishing fleet consist of less than 3,000 wooden boats, mostly motorised and being 5 to 6.5 meters long. The introduction of outboard motors is a recent phenomenon, which started in the late 1980s. According to 1991 statistics 96 percent of the then 2,500 crafts were not yet motorised, whereas presently the vast majority of the fleet is equipped with an outboard or small inboard petrol engine. Fishers mainly use hook and

[2] At present the exchange rate of US$ 1 is approximately Rp. 10,000

[3] Data related to the situation in 17 affected districts of Aceh province. There are various data on the pre tsunami number of boats. The 2003 statistics of the Ministry of Marine and Fisheries Affairs (MMAF) state a total of 16,431 boats, consisting of 6,258 without engine, 3,885 with outboard engine and 6,270 with inboard engine, while another MMAF provincial document refers to a 16,070 fishing fleet. The gap between the 16,500 figure and the 23,000 estimate used by FAO (based on assessment with MMAF) is at least partly due to registration problems, as many boats are not properly registered. However, this inaccuracy in baseline data has no direct impact on the damage assessment, as the data collected by different agencies regarding damaged boats only vary slightly (see annex 4 for detailed overview).

[4] The law banning trawling activities has some flaws, notes Pieter Flewwelling of FAO. The adjustment of the technical definition of trawler gear makes it possible to legally operate trawlers with small changes to the gear.

line, with gillnets being the second most used gear. The catch is mostly sold at nearby markets for local consumption. A small portion of high value fish and shrimp is exported through the harbour towns of Sibolga and Padang, both on the Sumatra mainland.

The provincial department of fisheries has the authority to issue fishing licenses for vessels up to 30 GT. Bigger vessels are being handled by the central government, i.e. the Ministry of Marine Affairs and Fisheries in Jakarta. Those licences generally cover an extended area, beyond the borders of the provincial territorial waters. The law requires that the central government consults and requests approval from the concerned provincial authorities before issuing a license.

In addition to the capture fishery Aceh has developed a substantial aquaculture industry in salt, brackish and fresh water species. With a total production of 29,000 ton in 2003, mostly shrimp and milkfish, and area coverage of 36,000 ha Aceh ranks in the top five of Indonesian provinces. Aquaculture, especially pond cultivation which dominates the sector, provides a major contribution in terms of income and employment for coastal communities. Aceh's aquaculture sector is concentrated on the northeast coast in the districts of Aceh Utara, Bireuen and Pidie. The farm-gate value of aquaculture produce in Aceh reached US$ 56.3 million in 2003 according to government statistics.[5] FAO consultants estimate that the sector employs around 94,000 people, although MMAF statistics mention only 15,000 brackish water farmers. However, the latter is only referring to owners while FAO also includes workers, as each hectare of pond is providing an estimated direct employment for 1 to 3 people.

Aquaculture in Aceh is mostly small scale and traditional low input farming. Only a small proportion of farms use intensive or semi-intensive farming systems. Most traditional farmers operate less than 2 hectares of pond, with varying land/farm ownership and employment patterns. Some ponds are owner-operated; others are rented or use contract farming or a share system. Given the large investment needed some owners borrow capital in exchange for a share of the profit, paying labourers also a percentage of the harvest value.

## 2.1 Small scale fisheries depending on big money

Despite its small scale nature the fishery sector in Aceh is directly linked to bigger business interests through a variety of complex patterns of capital inputs. Those providing the capital are generally referred to as '*tauke*' i.e. boss, with a clear distinction between *tauke bot* (owner or shareholder of boat) and *tauke bangku* (literally 'banker', usually big traders who provide loans for operating cost of boats such as fuel and food, or capital for traders to buy fish.

While most boats are privately owned by individual fishers, a portion of the larger boats (17-24 meters length) is fully or partly owned by businessmen. Most of the commercial purse seine boats in Banda Aceh are owned by businessmen cum investors. They don't interfere directly with the daily fishing operation, which is the responsibility of the '*pawang*', the captain, assisted by the engineman. Some boat owners are active or former *pawang*, sometimes operating one boat themselves while a second boat (or more) are operated by relatives or other locals. The financial arrangements of profit sharing vary per locality and region. In general the boat owner takes a 50-60 percent cut of the profit, of which he gives a 5-7 percent cut to the *pawang*. The latter also gets a bigger share of the 40-50 percent set aside for the crew. In case the *tauke bangku* takes care of

[5] Various figures are mentioned by the Fisheries Department and FAO assessment studies, varying in size of plots (FAO refers to 46.000 ha and KKP 36.000 ha) and total fishery value (FAO mentions Rp 1,59 trillion and DKP Rp 1,40 trillion), but nonetheless stresses the importance of the aquaculture sector constituting around 30 % of total fishery value.

the operating cost, he is also entitled to a profit share of 5-10 percent on top of the reimbursement of operating cost. Credit is a means to 'strengthen' the relation between trader and fishers: money is used as a moral force to oblige the fishers to sell their produce to their 'loyal' trader. The same goes for local fish traders, who receive working capital from Medan based exporters which compels them to use the same channel to market their product.

While outsiders often define the credit system as exploitive, local fishers and traders do not automatically share this point of view. While some agree and point out the dangers of getting trapped in debt, sometimes resulting in loss of boat ownership, others tend to differ. With no or little access to formal bank loans, they are in need of a source of easy available credit. Furthermore, the *tauke* brings in valuable marketing knowledge and skills, which the fishers lack. Some make a clear distinction between trustworthy local *tauke* and the exploitive outsider. Others stress regional differences in the degree of dependency.

## 2.2 Traditional dispute settlement and illegal fishing

Aceh fishing communities still acknowledge and respect the traditional local authority of the *panglima laot*, the so-called 'commander of the sea' whose territory is restricted to a single estuary or bay. This traditional institution dates back to the 14th Century and was established by the ruling Sultan when he appointed local leaders among the fishers to collect taxes. Later it developed into a fully-fledged traditional rights institution, with rules and regulations governing coastal communities with regard to fishing operations as well as social life, including dispute settlement. The rules dictate, for example, who is entitled to the catch sighted at sea, ban fishers to fish on Fridays, oblige them to stop fishing and start searching in the unfortunate event of a fisherman drowning and enforce protection of their coastal environment.

Aceh is dividing in 140 'lhoks' or estuaries, each with his own set of rules and its own leader.[6] Fishers of each area elect their own *panglima laot lhok*, according to their own rules and regulations.

In recent years the government has become involved and topped up the local *panglima laot* structure with a coordinating provincial body, thus adjusting it to its own hierarchical administrative system. The new structure should enhance the partnership between *panglima laot* and the fisheries department both at district and provincial level to promote the development of fisheries. Some applaud the extension, arguing that the often minim level of education of local leaders is now being backed-up by competent and skilled staff of the provincial body enabling the institution to advocate the interests of fishers rights.[7]

Others however oppose the move, claiming the *panglima laot* should stick to their traditional role at the local level, focusing on dispute settlement, not on government policies and politics. The government regulations to strengthen the position of the *panglima laot* at the same time undermine their independence as newly elected leaders have to be confirmed by an official letter of appointment.

[6] Traditionally each local territory in Aceh was ruled by a group of local leaders familiar with the traditions. While the panglima laot looks after the sea, there are others who hold authority over the rice fields and irrigation cannels (*kecyuen blang*), the forest area (*panglima uteun*), market and trade (*haria peukan*), the harbour (*syah banda*) and if applicable even gold mining (*keujruen meuh*) The government administration has partly replaced the traditional institutions, which were further weakened by the armed conflict and consequent military operations.

[7] For example it provides legal support to Acehnese fishers who are caught in the territorial waters of neighbouring India, Malaysia and Myanmar

The institutional changes of the *panglima laot* coincide with a successful campaign by fishers against illegal fishing by foreign trawlers, mostly from Thailand and Myanmar. Indonesian waters are a heaven for illegal fishing operations due to a variety of factors.[8] While modern equipped vessels from neighbouring countries get attracted by the richness of the Indonesian fishing waters, Indonesia has difficulties safeguarding the area due to the vast maritime waters, lack of detection and monitoring facilities like radar, helicopters and speedboats and deep rooted corruption. Until the late nineties, the territorial waters of Aceh were no exception. The *panglima laot* played an important role in the anti-illegal fishing campaign, organising local fishers with the support of several NGOs. Their actions resulted in the seizure of around forty Thai trawlers and their subsequent public auction. The proceeds from the action became a point of dispute, as they were eyed by several parties and claimed by both the local *panglima laot* and the provincial body which was established around that time. In the end the money, the substantial sum of Rp. 11,9 billion (US$ 1,9 million) was transferred to the YPMAN Foundation, an educational foundation set up by the provincial *panglima laot* to provide scholarships for children of fishers.

## 2.3 Impact of the armed conflict

For almost three decades, Aceh has been the battlefield of an armed conflict between the rebel Free Aceh Movement (*Gerakan Aceh Merdeka* or GAM) and the Indonesian security forces. An estimated 15,000 people lost their lives due to the conflict, most casualties being civilians. Although the rebel fighters constitute just a small group among the 4.2 million Acehnese, the movement at certain times could count many supporters among the population. Most civilians however have unwillingly become part of the conflict, being suspected by one or the other side of being a spy or supporter, facing extortion and being forced to share their harvest or business profit, being restricted in movement and living in fear. The coastal communities and fishers are no exception.

Fishing activities have at times been severely hampered due to the conflict. In many coastal areas fishers regularly have been subjected to surveillances and checks by the security forces, thus being prevented from going to sea. Fishers at times stayed ashore due to a ban announced by one or the other party, sometimes because their boats were seized, but more often out of sheer fear. Local people were constantly in danger of being branded as spies of the military or conversely as members of the GAM.[9]

The conflict has not only affected the fishing capture activities directly but also indirectly through the decline or destruction of basic infrastructure, lack of regular transport facilities, forced closure of ice-production units and trading companies.[10] In many coastal areas the fisheries infrastructure was thus already damaged before the tsunami struck. Despite substantial shrimp aquaculture production being located in Aceh, all but three of the export processing plants had already shifted to Medan before the tsunami, due to the conflict.

[8] State losses due to illegal fishing are estimated at US$ 2 billion annually and mostly blamed on foreign boat crews. As of 2007 Indonesia will stop allowing foreign fishing vessels to operate in Indonesian territorial waters, with the exception of foreign vessels working together with local fishing companies.
[9] Local leaders therefore become reluctant to interfere, afraid to get branded as well, just like local activists and organisations. Fear and actual restrictions severely undermined the role of civil society.
[10] In Calang for example a private owned ice factory was forced to close down in 2001. Thus the fishing sector there had to depend on supplies from Meulaboh or Banda Aceh, which not only increased the price of ice but also led to regular shortages of ice or even lack of supply for several days. In the same period, continuous extortion forced one major businessman to sell two of his three bigger boats.

Although the conflict did more harm than good to the fisheries sector in Aceh, the presence of the military kept illegal fishing activities at bay.[11] Not long after the successful action and seizure of 40 Thai fishing vessels, the conflict intensified again, resulting in an intensified presence of the Indonesian navy in the territorial waters of the coast of Aceh. The short-lived peace agreement which was initiated in 2002 did not result in a significant reduction of military presence, which eventually increased when the peace process collapsed and the military emergency was announced in mid-2003. The military emergency was later reduced to a civil emergency, but on the ground the military retained a dominant role.

[11] As stressed by the Head of the provincial Fisheries Department. The navy also increased its presence to guard territorial waters against GAM rebels. Some claim a post-tsunami increase in illegal fishing by foreign vessels due to the severe loss of Aceh based boats in the tsunami. Others however stress that these illegal fishing activities seasonal and linked to migration of fish in the so-called 'east season' which attracts foreign fishers to the Indonesian territorial waters.

# 3 Rehabilitation of Fisheries-based Livelihoods

The tsunami which hit the coastal shores of Aceh in the early morning of December 26th caused severe loss and damage to a majority of the coastal communities in terms of lives, shelter, livelihoods and infrastructure. The huge waves devastated more than 800 kilometres of Aceh's coast, penetrating 1-2 kilometres and at some places even 3-6 kilometres inland. Nearly 130,000 people in the province are now confirmed dead, with another 37,000 missing, i.e. perished. In addition, at least 1,659 people died in Nias due to 28 March 2005 earthquake.

A substantial number of fishers lost their lives in the disaster. In total an estimated 9,083 fishers perished or a little more than 10 percent of the fishers working in the affected area. Many of those who survived had to cope with the loss of their loved ones. The majority of the casualties were women, children and the elderly. The death toll among women as compared to men was 3:1.[12]

## 3.1 Damage to craft, gear and livelihoods

The total damage regarding fisheries-based livelihoods is an estimated $ 600 million of the total of $1.2 billion loss in the productive sectors as a whole, i.e. 50 percent of the total losses. These figures cover both damage to private and public property, including infrastructure, but also loss of business income.[13] The first three month all fisheries-based livelihoods come to a halt. Even the operational vessel stayed ashore, firstly because everybody was busy looking for relatives, cleaning up the mess and adjusting to live in refugee camps or with family. People also lost their taste for fish, with tens of thousands of died bodies being washed by the sea. Now fisheries activities have gradually restarted, first by those whose vessels, gears and tools were not damaged by the tsunami, and now also by those who already received aid to restart their business although only partly. Many started looking for other temporary work, like cash for work projects, or selling cigarettes, running a small food stall etc, to make ends meet. It will take some more time before the affected communities can stand on their own feet again. Many are still depended on the monthly food ration.

The tsunami has affected all: small fishers, big vessel owners and crewmembers, aquaculture farmers and their workfolk, fish processors, workers and fish traders.[14] Those with a broad network of unaffected family members and friends had a head start, being able to borrow some money to start some kind of business by themselves, not needing to wait for help from aid agencies.

Below is a more detailed account of the damage to craft, gear, engines, fisheries infrastructure and aquaculture.

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[12] See: See Oxfam Briefing Notes: Tsunami Impacts on Women March 2005. Accessed 5 Dec 2005: http://www.oxfam.org.uk/what_we_do/issues/conflict_disasters/downloads/bn_tsunami_women.pdf.

[13] Figures quoted from BRR December report. An earlier estimate of the DKP put the value of fisheries assets at $ 290 million (Rp 2.9 trillion), of which $ 120 million damaged or lost by the tsunami, with an additional loss of business income (harvest ponds and capture fish) of $ 280 million. Damage regarding fish processing is not mentioned, and damage to ecosystem explicitly excluded.

[14] It seems a higher percentage of the larger vessels were spared compared to the smaller boats because many of them were still out at sea when the tsunami struck, but not all of those at sea were spared. Some of the damaged larger vessels have been quickly repaired as they are owned by businesspeople from outside, but the 'poorer' local owners can't fall back on aid, due to their employer status, and they need more time to get the funds, while repairs usually also take a few months..

**Boats**

The capture fishery in Aceh and Nias[15] has suffered extensive damage as more than one third of the craft in the affected areas has been lost. In total more than 10,000 boats from various types and sizes were lost or damaged.[16] The ones that remained intact were mostly out on the sea, including the bigger purse seiners.

Table 1 below gives an overview of the damage in Aceh regarding boats with an outboard engine (OB), with an inboard diesel engine (IB) and non motorized boats (N), with separate figures for the east and west coast. In general boats on the east coast are open style with an inboard diesel engine, varying in length between five and twelve meters, with most being seven or eight meters long. On the west coast more boats are fully decked with an average size of twelve meters.

**Table 1 Boats lost and damaged in Aceh**

| Type boat | Before Tsunami | | | Lost | | | Damaged | | |
|---|---|---|---|---|---|---|---|---|---|
| | East | West | Total | East | West | Total | East | West | Total |
| OB | 3,155 | 1,337 | 4,492 | 1,774 | 429 | 2,203 (49.0%) | 164 | 51 | 569 (12.7%) |
| IB | 5,957 | 3,909 | 9,866 | 1,509 | 902 | 2,411 (24.4%) | 1,140 | 530 | 1,670 (16.9%) |
| Non | 3,907 | 5,889 | 8,996 | 2,110 | 894 | 3,004 (33.4%) | 14 | 160 | 174 (1.9%) |
| Total | 13,019 | 11,135 | 23,354 | 5,393 | 2,225 | 7.618 (32.6%) | 1,318 | 741 | 2,413 (10.3%) |

Source: FAO 2005 March
For a more detailed breakdown per district see Annex 5

The data indicate a significant heavier loss of vessels with outboard engines in Aceh compared to vessels with inboard engines and non motorised boats. One reason might be that outboard engines are mostly used by fishing communities that don't have access to a natural harbour and have to 'park' their boats right on the beach. The inboard motors are preferred by living near a usually shallow estuary, which might have provided some protection. Others were saved because they were at sea. The relatively low losses among non-motorised boats could be because they are found operating more upriver, as many of the coastal vessels have become motorized since the late 1980s. However, the district break-up of the losses and damage of boats by propulsion (see Annex 5) a different and more varied picture. In the heavily affected districts like Banda Aceh, Aceh Besar, Aceh Jaya and Nagan Raya, the loss of non motorised boats equals more or less the percentage of loss of boats with outboard and/or inboard engines. No clear pattern emerges from

[15] The damage in Nias was caused by both the tsunami as well as the major earthquake that hit the island three months afterwards on March 28th. Although that earthquake did not trigger a tsunami, waves did rise to a height of more than two meters, causing extensive damage to boats lying on the shore.
[16] The data seem quite accurate, despite a slight variation depending on definition, source and time of assessment. The DKP notes a total of 9,559 boats as lost (OB: 2369, IB: 3969, Non: 3225), but does not talk about damaged craft, while the FAO figure for the west coast is slightly higher (by 240) in an April mission report.

this district break-up of loss of vessels, indicating that the variation might be based differences in local situation and circumstances.

The island of Nias lost around 40 percent of its fishing fleet, with a total of 1,062 boats being lost or severely damaged. The damaged boats consist of 650 boats with outboard engine and an average length 0f 6.5 meters and 412 non motorised canoes less than 5 meters long. Many boats were damaged by the second earthquake in March 2005, by the 2 meter high waves that hit the shores and thus the boats.

**Table 2 Estimated value of craft lost and damaged in Aceh**

| Area | Lost | | Damaged | | Total | |
|---|---|---|---|---|---|---|
| | Number | Est. Value US$ | Number | Est. Value US$ | Number | Est. Value US$ |
| East coast | 5,393 | 6,388,278 | 1,672 | 934,667 | 7,065 | 7,322,945 |
| West coast | 2,464[17] | 1,908,301 | 742 | 184,500 | 3,206 | 2,092,801 |
| Total | 7,857 | 8,246,579 | 2,414 | 1,119,167 | 10,271 | 9,415,746 |

Source: FAO March 2005

Replacement of lost craft will cost an estimated $ 10 million dollars according to FAO. The Fisheries Department earlier estimated the damage of craft to be around $ 28 million, including damage to engines. Although separate estimates of loss of craft, gear and engine of both agencies vary significantly, the total sum of estimated damage is more or less the same, i.e. in between $ 38 million (FAO) and $ 44 million (DKP).

**Fishing Gear**

Around three quarter of the fishing gear in Aceh's tsunami hit areas was lost or got severely damaged as both gear on the boats as well as the gear stored on the beaches, in houses and sheds got washed away. Of the 26,000 units gear inventoried in 2003 around 20,000 units are damaged, with an estimated financial loss of US$ 18 million. Money wise the damage of the gear is twice as high as the damage of the craft.[18] Most vessels are equipped with several sets of different nets, which they all use depending on the season, the type of fish and fishing method (day or night). The most common used gear in Aceh is the gill net (32 percent) and the fishing lines (38 percent), according to the 2003 statistics, while purse seine, shrimp nets and traps account for around 7 percent each (see also Annex 4 for overview of pre-tsunami type and number of fishing gear).

**Table 3 Estimated price of fishing gear list in Aceh**

| Gear | Mat* | Lost units | | | Estimated Price US$ | | |
|---|---|---|---|---|---|---|---|
| | | East | West | Total | East | West | Total |
| Drift gillnet | Mn | 65 | 269 | 334 | 5,778 | 91,167 | 96,945 |
| Bottom gillnet | Mlt | 3,656 | 1,123 | 4,779 | 1,212,167 | 327,400 | 1,539,567 |

[17] The number of lost craft on the west coast is slightly higher than stated in the previous table, for which no explanation is given, although both tables are taken from the same FAO Consultant Mission Report by Akmal Syukri, March 2005. According to the BRR fisheries staff the first assessment of 10.000 boats lost and damaged has later been increased to around 15.000 boats, with the additional 5.000 damaged boats found in districts that earlier had been thought to be free of damage. In the meantime most of these damaged boats have been repaired according to BRR.

[18] The secretary of the Panglima Laot Province contributes the high cost of gear to the relatively large size of nets being used in Aceh.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Shrimp gillnet | Mlt | 726 | 150 | 876 | 221,375 | 49,125 | 270,500 |
| Trolling line | Mn | 3,391 | 635 | 4,026 | 10,682,222 | 1,265,278 | 11,947,500 |
| Hand line hook | Mn | 4,429 | 4,054 | 8,483 | 1,322,583 | 346,111 | 1,668,649 |
| Bottom long line | Mlt | 424 | 187 | 611 | 36,333 | 81,667 | 118,000 |
| Drift long line | Mlt | -- | 4 | 4 | -- | 1,778 | 1,778 |
| Beach Seine | Mlt | 31 | 54 | 85 | 103,333 | 180,000 | 283,333 |
| Mini purse seine | Mlt | 419 | -- | 419 | 698,333 | -- | 698,333 |
| Purse seine | Mlt | 121 | 10 | 132 | 1,478,889 | 122,222 | 1,601,111 |
| Danish Seine | Mlt | -- | 33 | 33 | -- | 55,000 | 55,000 |
| Mini trawl | Mlt | -- | 35 | 35 | -- | 77,778 | 77,778 |
| Total | | 13,262 | 6,554 | 19,816 | 15,761,014 | 2,597,525 | 18,358,539 |

Source: FAO 2005 March
* Material: Mn=Monofilament, Mlt=Multifilament

**Engines**

The FAO inventory of lost and damaged engines indicates that only few engines of the damaged motorised boats are not damaged at all, while most, i.e. more than 6,700 engines were severely damaged. They can be considered as lost with an estimated replacement cost of almost $US 10 million.

The damaged engines consist of a broad variety of types, both inboard and outboard engine.[19] The most popular, the Chinese 'Dompeng' inboard diesel engine accounts for one third of the damaged engines. Its popularity is largely due to its cheap price and easy maintenance.[20] A Honda 7.5 HP inboard engine costs almost 4,000 dollar, whereas a 7.5 HP Dompeng costs not even 300 dollars, according to FAO price estimates. In general it's the price that decides the choice of engine, not the quality. Fishers are aware that in general expensive engines last longer, but their limited resources restrict their options. Some donor agencies opt for quality replacement, providing the more expensive Yanmar engines. Most however just replace the lost engines with the same cheap type of engine, despite its limited life span.

**Fisheries Infrastructure**

The tsunami almost completely destroyed the existing infrastructure for capture fisheries in Aceh, including its biggest fishing port in Lampulo, Banda Aceh. On the west coast all harbours and landing piers between Lhok Nga and Meulaboh are totally wiped out, with the exception of the Meulaboh harbour which is till operational although heavily damaged. On the east coast the larger facilities have been badly damaged, as far south as Lhokseumawe the smaller landing sites were almost all lost.

Indonesia categorises harbours and landing centres according to size and budget resources, ranging from type A to E. The fishery harbours fall in the categories type C to E, with the larger type C facilities being funded and run by the provincial government, while the smaller D and E

[19] When adding up the various types of damaged inboard engines the total number, i.e. 4,949, it exceeds the total number of lost and damaged boats with inboard engines i.e. 4,081.
[20] The secretary of the Panglima Laot Province claims that the popularity of the Dompeng engine was pushed by government schemes, with officials looking for ways to 'save' money, buying cheap engines that could easily be marked-up in the budget. Pre-tsunami the Dompeng engine cost half the price of the Japanese Yanmar engine, which is considered to be the best in this category.

facilities fall under the responsibility of the district administration. In general they have a jetty or concrete wharf with a covered concrete auction space and a meeting hall, which often doubles as a godown and has a separate prayer facility. Many more smaller and simpler facilities have been funded and are run by local fishing communities themselves.[21]

The table below gives an overview of the damage to the various infrastructure caused by the tsunami, such as ports and harbours, landing piers, landing sites, ice plants and meeting halls (cum auction hall and godown with prayer facility) and fish aggregating devices (FAD).

**Table 4 Infrastructure lost and damaged in Aceh**

| Area | FAD | Landing pier | Landing Site | Ice plant | Fuel station | Meeting Hall |
|---|---|---|---|---|---|---|
| East coast | 164 | 22 | 32 | 13 | 9 | 42 |
| West coast | 15 | 2 | 25 | 7 | 1 | 32 |
| Total | 179 | 24 | 57 | 20 | 10 | 74 |

Source: FAO 2005 March

Just like the landing centres the already limited number of operating ice plants were also severely hit by the tsunami. Twenty out of thirty ice plants were damaged. Some however had been closed down before the tsunami due to the conflict. Panglima Laot Province estimates that 15 out of the 20 damaged ice plants were operational at the time of the tsunami. Two of the biggest commercial plants with a capacity of 65 and 45 tonnes per day were destroyed. These big ice plants were respectively located in Krueng Raya near Banda Aceh and in Meulaboh. Many of the smaller plants in small centres have also been destroyed. On the west coast no ice plants were operational after the tsunami except for a few smaller plants south of Meulaboh in Blang Pidie. The northern section has to depend on two ice plants in Banda Aceh with a capacity of 35 and 50 ton/day. On the east coast fishers have to do with limited quantities from local sources, among others one privately owned plant in Pidie. Even in the present time of still limited fishing activities there is a shortage of ice, with extra transport cost adding to an already considerable increase of prices. Many small scale fishers make their own ice in domestic refrigerators.

The ice shortage has also a major impact on marketing. Without ice, fish mongers are compelled to buy only small quantities which they can sell of quickly before the fish turns bad. The only other alternative, i.e. to salt or dry the fish, is hardly an option post tsunami, due to the damaged fish processing infrastructure and the lack of working capital. Many fish vendors themselves live in the coastal area and have lost not only their house, but also baskets, ice-boxes and their bicycle or motor bike which served as their means of transport.

Fish processing infrastructure, in particular the sheds, drying racks and cooking equipment of the small scale fish drying units have been almost totally destroyed as most of them were situated directly on the beach. A total of 1,235 fish drying facilities are lost or damaged beyond repair. Most drying facilities are on the east coast, as in shown in the table below.

**Table 5 Fish drying facilities lost**

[21] According to the provincial department data there are 253 locally run landing sites. They serve as a source of income for the community, as a percentage of the auctioned harvest goes to local organizations like the *panglima laot*, the mosque and youth groups. Some view the upgrading of those facilities by the district fisheries authorities as a means to secure an income for the officials themselves while depriving the community of a source of income.

| Area | Drying facilities |
|---|---|
| East coast | 1,060 |
| West coast | 175 |
| total | 1,235 |

Source: FAO 2005 March

Marketing figures indicate it was a thriving industry with 20 percent of the fish capture being processed, mostly dried and salted. The major centres of fish processing are located on the east coast in areas such as Pante Raja were many vessels use anchovies nets to harvest the small anchovies fish or *ikan teri,* which is the most popular dried fish species.

Salt farm units were also severely damaged, with salt pans inundated and destroyed sheds and cooking gear swept away. Like fish processing units they are also located close to the sea and thus were the hardest hit. Salt farming is mostly done by poor families and is one of the sectors were many women are active, just like fish processing.

**Aquaculture**

Aceh's aquaculture consists predominantly of embankment fish farming, which is brackish water shrimp and milkfish cultivation in ponds or *tambaks* that are located close to the shore. The rapid development of the sector has gone hand in hand with a rapid reduction of the coastal mangrove forests, especially on the east coast, leaving little or no protection against the tsunami waves. It resulted in an extensive damage to ponds and associated infrastructure such as dykes, floodgates, farmers' huts and machinery. The damage ranges from light damage to dykes to complete loss of ponds, as they sometimes have simply been lost to the sea. Along with the waves came building debris, mud and silt causing heavy sedimentation in ponds and irrigation canals. The damage to the canals has also disrupted water supply in other ponds further inland. This has caused a production stop of an estimated extra 5,000 ha of fishponds apart from the direct damage and loss of around 20,000 ha of embankment as in shown in Table 6 below.[22]

**Table 6 Embankment area and damage (in ha. and %)**

| Area | Pre tsunami embankment | Damaged embankment | Damage percentage |
|---|---|---|---|
| East coast | 44,624 | 19,826 | 44% |
| West coast | 452 | 452 | 100% |
| Total | 45,077 | 20,279 | 45% |

Source: FAO 2005 March

With the loss of the ponds, farmers also lost their crop and thus their working capital, with the prawn seeds and milkfish being swept way. Extensive damage was also suffered by 193 of the 223 shrimp hatcheries across Aceh. On Nias and Simeulue Island many of the fish nets cages have been damaged or destroyed.

All in all, due to the tsunami half of the aquaculture operation came to a halt, directly affecting the livelihood of an estimated 40,000 people who found employment in the sector. The tsunami also destroyed the aquaculture training centre of the Fisheries department in Ujung Batee near Banda Aceh.

[22] The MMAF statistics state different data, i.e. a total embankment area of 36,500 ha of which 14,500 ha were damaged, which also results in 40 percent damage. FAO consultants indicate that the official figures might be underestimated as officials at district level quote larger embankment areas.

The damage and destruction in both capture fisheries and aquaculture has a direct impact on the livelihood of many coastal people, whose work is directly or indirectly affected. Neither were other economic sectors spared: farmland and crops got damaged because they were inundated by salt seawater and fields were covered with silt and debris, while craftsmen and shopkeepers lost their tools and stock. After the tsunami government officials including teachers were more or less the only the group of workers whose income was safeguarded.

## 3.2 Funding and Organisations

It will take an estimated US$ 5.8 billion to repair the damage the tsunami and the earthquake caused in Aceh and Nias. Most of that money, i.e. $ 4.4 is already committed to specific projects. In total an unprecedented sum of $ 7.5 billion was pledged by the following sources: multilateral donors $ 2 billion, bilateral donors $1.6 billion, NGOs $1.8 billion and the Government of Indonesia $ 2.1 billion.

Within days after the tsunami Indonesia lifted Aceh's military restrictions, letting thousands of foreign troops enter with their equipment. Along came the civilian aid workers, both professionals and volunteers from all over the world. Many left once the emergency period ended, spending over one billion dollars on relief aid. Hundreds of organisations stayed back for the rehabilitation and reconstruction work, among others 124 international NGOs, 430 local NGOs, dozens of donor and UN organisations and various government organisations[23].

**Coordination and Collaboration**

The GOI was clearly overwhelmed by the huge disaster and the wave of aid agencies. Local governments were severely affected with many casualties among their staff and loss and damage of facilities. Disaster experts from outside, mostly foreign emergency workers from UN institutions and INGOs took the lead in the coordination of aid. It only partly succeeded, unable to include local organisations and small donor agencies due to language problems and perceived foreign domination. The latter was also fuelled by the security forces and politicians trying to impose a time limit on the presence of foreign aid workers. It took the Indonesian more than three months to establish a separate coordination body by presidential regulation, called the Reconstruction and Rehabilitation Agency (BRR). It took almost another three months before BRR became fully operational mainly due to delays in budget clearance.

The BRR operates on top of the existing Coordination Agency for the Management of Disasters and Displaced Persons (Bakornas) which is headed by the vice-president, aided by nine ministers, governors, national police and Indonesian military chiefs. Bakornas has subsidiaries on the regional and municipal level, but they lack operational funds which should be provided by their respective local governments. Most ministries have their own mechanism and funds to provide emergency and disaster aid. Indonesia has more than 100 legal regulations regarding disaster management, but a comprehensive law on disaster mitigation is still lacking. Given the need of the presidential regulation to establish an effective coordination agency, the parliament is now drafting a new law on disaster mitigation which allows the creation of a new independent agency.[24]

[23] Data according to BRR registration. Ran database counts 414 local and international organisations active in Aceh and Nias.

[24] The new agency should not only consist of government officials, but should also include representatives of civil society and disaster experts. The new law should fill the gaps in existing regulations, but foremost

**The Main Players**

*BRR*
BRR's main role is to coordinate the disbursement of aid funds and ensure that they are used effectively, quickly and transparently. The agency operates from its headquarters in Banda Aceh with two regional offices in Nias and Jakarta. BRR has a full time staff of 124, with 24 technical advisers. As a coordinating body it tries to keep track of all the reconstruction activities, it seeks to ensure community participation and quality standards are upheld, to identify problems, gaps and areas of need and to help finding solutions in close collaboration with government bodies, NGOs, communities and civil society.

BRR has several divisions, each concentrating on a specific area of reconstruction like shelter, education, health and natural resources and livelihoods. Fisheries are a separate subdivision under Natural resources and Livelihoods. The fisheries subdivision works in consultation with a steering group, on which the main players in the sector are represented such as the Provincial Department of Fisheries, its technical counterparts from FAO and ADB, some donor agencies and the provincial *Panglima Laot.*

*Government Fishery Institutions*
Three fisheries related government bodies are directly involved in the rehabilitation process, i.e. the Ministry of Marine Affairs and Fisheries (MMAF), the provincial Department of Fisheries (DKP) and the district Bureau of Fisheries. The Jakarta based MMAF is responsible for the major harbours and ports and involved in planning and channelling of multilateral and bilateral projects. In the latter capacity MMAF is the facilitating counterpart of the Fisheries Programmes of both ADB and FAO. On the ground however the afore mentioned agencies work in close collaboration with the provincial Fisheries Department and with the district Fisheries Bureau. With the start of the decentralisation process in 2001 a major part of the provincial responsibilities were transferred to the district level.[25] Aceh's Special Autonomy status reinforces the provincial authority with extra funds and possibility of entering into forms of direct international cooperation.[26]

During the next few years large amounts of aid will be channelled to and through the Fisheries Department. The debt moratorium relocation is estimated to add $24 million to the fisheries budget, while the ADB fisheries project budget is around $30 million for three years and the Multi Donor Trust Fund can generate another few million dollars. The present $ 2.9 million budget allocation for 2005 is mostly being spent on rehabilitation and improvement of harbour landing facilities (PPI) in 5 sub districts i.e. Sabang, Aceh Besar, Pidie, Bireuen, and Calang. The $ 7.4 million ADB budget for 2005 will also be spent on rehabilitation in both Aceh and Nias.

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generate an effective coordination body, as Indonesia is a country prone to disasters both natural and man-made.

[25] At present the provincial Fisheries Department is more or less ignored by the district fisheries departments, as they now financially depend on their district government. The provincial department which is the nodal agency for various projects hardly has access to data on the situation in the districts, while it is also being ignored by INGOs.

[26] The provincial Fisheries Department hopes that the Special Autonomy Law opens the door to direct fish exports as Banda Aceh can gain the status of international airport and Krueng Raya might become an international port, thus being able to profit from the international contacts established in the aftermath the tsunami, e.g. by exporting shrimps to Italy.

*UN and International Financial Institutes*
Money-wise the ADB is the biggest player in the rehabilitation of Fisheries with its $30 million ETESP project. ADB Consultants have already drafted the plans for ETESP- that comprises six subcomponents, namely: community empowerment; rehabilitation of small-scale capture fisheries; rehabilitation of aquaculture facilities and production systems; rehabilitation of small-scale fish landings and post-harvest facilities; coastal resource rehabilitation; and support services restoration and provision. ADB and GOI signed the ETESP agreements in April 2005. Disbursement of the 2005 project of $7.4 million has been delayed by slow budget approval but is now underway. The 2005 budget year will be extended to April 2006 and the project focus will be on nine sub-districts in Aceh Besar, Pidie and Aceh Utara. The first grant disbursement agreements which were only signed in December 2005 allocate a $2.5 million grant to the development of sustainable livelihoods in 20 coastal communities in Aceh Besar and Aceh Utara, while another $1.5 million goes to rehabilitation of 30 ha of coral reefs and 300 ha of mangrove forests.[27]

FAO is one of the major players when it comes to technical inputs. It has produced a series of assessments regarding the damage and rehabilitation in various fisheries sub-sectors, such as capture fisheries, aquaculture, boatbuilding, infrastructure and fish processing. FAO data combined with MMAF baseline data serve as a basic source for policy development. FAO has established an office in Banda Aceh and is running several projects. However, contrary to other UN organisations its resources are limited. FAO is now trying to secure access to the well funded INGOs like the International Federation of the Red Cross and Red Crescent (IFRC), offering technical assistance for the planning and implementation of fisheries rehabilitation projects.[28]

*International and Local NGOs*
Many international and local organisations, but also individuals, contribute to the rehabilitation of fisheries as it is one of the major sources of livelihood in the tsunami affected coastal areas. None however focus exclusively on fisheries and fishing communities. Donors such as Oxfam, Mercy Corps, ICR, but also UNDP and JICA provide funds for various economic activities, starting with cash-for-work projects and are gradually moving on to target specific sectors, including fisheries. Most of these funds are channelled to local organisations that serve as implementation partners. Only a few of these local NGOs had been working with coastal communities previously with a specific focus on fishery issues, including Pugar in Banda Aceh and Papan in Meulaboh.[29] A few others like YBK, CDI, Paska and Sahara were active in fishing communities but focusing on the broader issue of livelihood and economic resources.

*Traditional Institutes*
*Panglima Laot* is the only local fishers' institution that has a long history in fisheries and is strongly embedded in the coastal communities. As such is has attracted a lot of attention from aid agencies, who see it as a source of information but also as a potential service provider. Most focus on the provincial *Panglima Laot* as the central representative of the regional network, which is easily accessible with its office in Banda Aceh and some well educated English speaking staff. The provincial *Panglima Laot* itself is also actively positioning the organisation as a major

[27] A third grant agreement was also signed on December 15th 2005 regarding a $2 million grant to develop prototypes of earthquake resistant housing including building 300 such units in 16 affected areas.
[28] FAO is entering a strategic partnership with IFRC to build larger vessels to develop the deep sea fisheries. In earlier stages it secured financial support from several donors to train boat builders and publish guidelines on boatbuilding and rehabilitation of aquaculture.
[29] The tsunami aid wave resulted in a significant increase in local organisations. Meulaboh which earlier counted only three NGOs now has nearly twenty organisations.

stakeholder in the rehabilitation process, to safeguard the interest of the local fishing communities. However, the local *panglima* are not always directly involved, sometimes even sidelined by aid agencies and other local leaders, especially during the initial relief phase. Now most are at least consulted, while a large group is more actively participating and sometimes implementing projects themselves. The provincial organisation warns not to undermine the institution by burdening the *panglima laot* with financial responsibilities, thus creating a potential source of conflict and distrust.

## 3.3 Interventions in pre-harvest, harvest and post-harvest sector

'Don't give them fish, but a boat to go fishing.' An advice many literally acted upon. Providing boats to the coastal communities has proved to be a popular way of helping people, mostly so because it was perceived as a quick, visible, not too complicated and also not too expensive intervention as far as small boats are concerned.

In general one can say that all interventions aimed at providing the affected communities the 'tools' needed to restart their economic activities and enabling them to look after themselves. The most common interventions are:

- Cash for work, clearing debris from landing sites, beaches, estuaries and ponds, replanting mangroves
- Providing tools, sheds and training to boat builders
- Repairing and replacing craft, gear and engines
- Rehabilitating embankment area and irrigation cannels
- Helping kick-start sector related and supporting economic activities like production of ice and salt, provide transport and capital to fish vendors, rebuild fish processing units
- Repairing infrastructure on a small scale, as many of the larger projects are still pending

Although government and aid agencies aim to 'Build a Better Aceh', interventions in this direction have been limited, partly due to the chaotic start and lack of coordination, but also because some targeted improvements are part of the long term plan which are still under process and not implemented as yet, for example integrated infrastructure projects. Interventions that go beyond replacement of losses include:

- Boat builders training focusing on technical quality improvements related to design and material
- Promotion of transparent local cooperative management structures, strengthening local institutions, strengthening bargaining position of fishers and local traders
- Promotion of community participatory approach
- Safeguarding environment by replanting mangrove to strengthen embankment areas, promote environmental friendly silvo-fish culture
- Promote sustainable fishery methods but also expand deep sea, export oriented fisheries
- Quality improvement of fish processing

**Replacement of Craft and Gear**

According to the government coordination agency BRR a total number of 1,210 boats had been built by the end of November with a further 7,234 more planned. A far more detailed assessment by the *panglima laot* at the request of FAO already counted more than 1,600 boats being replaced

by the end of September. In BRR year summary report the figures are updated, with 3122 boats of a total of 4717 lost boats have been replaced or being built.[30]

**Table 7 Replacement and repair of boats in Aceh**

| Progress Activities | Material and Size* | | | | | | | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | W-A | | F-A | W-B | | F-B | W-C | | F-C | W-D | | F-D | | |
| | N+ | R | N | N | R | N | N | R | N | N | R | N | N | R |
| Delivered | 717 | 98 | 103 | 642 | 101 | 118 | 80 | 21 | -- | 1 | 4 | -- | 1,661 | 224 |
| Under construction | 371 | -- | -- | 532 | 17 | 146 | 224 | 6 | -- | -- | -- | -- | 1,273 | 23 |
| Pledged | 259 | -- | 100 | 206 | 8 | -- | 451 | -- | -- | 46 | -- | -- | 1,062 | 8 |
| Total | 1,347 | 98 | 203 | 1,380 | 126 | 264 | 755 | 27 | -- | 47 | 4 | -- | 3,996 | 255 |

*Material W=Wood, F=Fibre, Size A=5-6.5 mtr, B=7-11 mtr, C=12-16 mtr, D=16+ mtr
+N= New replaced, R= Repaired
Source Panglima Laot Province 2005, 29 September

The different figures, and more so the large differences, underline the rather chaotic aid and lack of coordination, particularly during the first six months. Hundreds of individuals, companies, charity groups, aid organisations and government institutions have been offering help to the affected fishing communities, offering boats (new and second-hand) or funding for the construction of boats, ranging from one single boat to hundreds of boats. As can be seen in the table the most boat aid focuses on the 7-11 metres boats. This size is the most common used in Aceh and many of them got lost or damaged. However, it is also a popular boat category among the aid agencies, because of its affordable price and simple design, thus easy to provide. The distribution of the boats across districts has been uneven and supply driven. The four districts close to Banda Aceh account for 40 percent of boat losses but have received 75 percent of all boats distributed or repaired.[31] Other districts like Bireuen, Lhokseumawe and Simeulue are still waiting for the much needed boat support.

In the hasty boat supply process many problems occurred. Some donors only provided the boat, leaving it to the fishers to buy the engine and the gear, which are far more expensive. BRR estimates that of the 4000 boats that are being provided only 1000 have been equipped with an engine and only 600 have a complete set of gear, thus less than a quarter of the boats can be used right away to go to the sea. Some donors delivered the aid without consulting the community and its leaders, creating a potential source of social conflict especially if the aid was limited to a few people, or the recipients did not have a boat before the tsunami and sometimes even were not fishers at all. In other cases the boats designs were not fit for the local conditions or did not meet minimum quality standards, thus endangering the lives of the fishers. Problems with design and quality were partly due to the fact that boats were ordered outside the concerned villages, with boat builders not being familiar with local preferences.[32] The huge demand for boats also caused

[30] It remains unclear how all of the sudden the number of lost boats has been reduced from at least 7000 to less than 5000 boats. Even the BRR experts on fisheries can't explain were the figure comes from. Although the report refers to the FAO and Panglima Laot as a source, the parties themselves use the earlier mentioned loss assessment figure of 6000-6500 boats.
[31] The four districts are Banda Aceh, Aceh Besar, Aceh Jaya and Pidie. Information based on Panglima Laot assessment, but percentage of losses based on disputed total loss of less than 5000 boats, published in BRR year report.
[32] There is a great although often just slight variation in size of boats and boat design. FAO has made a detailed list by sub-district all the different boat sizes, combined with gear and propulsion use of gear.

many ordinary carpenters and furniture makers to jump at the opportunity, obviously they had no or very limited knowledge about boat building. Indirectly this also caused a shortage of suitable and well dried timber varieties.

**Box 1: Bad Practices - Providing and Allocating Aid-**

***Dumping aid without prior consultation:*** *The Kuwaiti Red Crescent handed out around 120 fibre canoe boats across affected areas, but none of them are used for fishing as the boats are considered too small and too light. 'If used at all, they are just good enough to transport jerry cans of drinking water,' notes one beneficiary.*

***One source doesn't cover the variety of local preferences****: Before starting the boat project MSF Lamno consulted one of the fishing communities in the affected area. Their preference for a boat with outboard motor became MSF's standard model. That preference is based on the fact that the concerned villages lacks a natural harbour, thus they pull the boats ashore and take the engine home. However, in neighbouring villages with access to a natural harbour, people prefer inboard motors, according to the panglima laot and fishers of Ujung Muloh. They, however were not consulted in this matter and now will have to accept the outboard motor boats. Some fishers have turned to family members for loans to buy a boat with inboard motor, which they argue is cheaper in operation cost (diesel instead of petrol) and easier to maintain. They used to have boats with a 'house', which would double as a kitchen and bedroom for night fishing. Nowadays boat builders reject orders for those models as they are more labour-intensive and the boat builders already have a lot of orders from donor agencies for smaller boats.*

***Wrong target group:*** *Not all men in coastal villages are fishers, even less so if they live a few miles inland. The eagerness to help quickly sometimes resulted in superficial checks and balances, thus giving out boats to non-fishers, while the real fishers are grounded ashore empty handed. That explains why in Jangka Buaya the 18 boats donated by USAID remain ashore too most of the time, as their owners are probably busy cultivating their fields.*

***Bad quality mixed with bad politics:*** *Nobody seems interested in the 70 boats the ministry of Social Affairs built in Meulaboh. Most are still waiting for an owner, while the dispute over the lack of quality and political collusion is heating up. The ministry is accused of handing the contract to a party member of the minister, who spent much less than quoted, using bad quality wood. While there are far more examples of badly built boats, which are usually discreetly abandoned (as local custom requires to show respect and not to hurt the feelings of the good willing donor), these boats attract a lot of public protests boosted by political opponents.*

However the list is not complete and lacks an overview. A detailed assessment of the combination of craft, gear and propulsion aid and its coherence is not available.

**Box 2: Best Practices -Targeting Improvements**

***A coordinated effort:*** *Boat building brochure and boat builders training. Technical assistance targeting both donor agencies and boat builders turns out a worthwhile intervention. A mission of a master-boat builder of FAO set off the alarm bells regarding the dangerously bad quality of newly built boats. A simple booklet with photographs of bad and best practices provides guidance to the lay aid worker and convinced several organisations like HELP Germany to enlist their boat builders for a co-financed training in their own workshop, thus ensuring the implementation of the lessons learned. FAO boat experts still regularly visit the HELP boat builders to check the quality standards. Guidance is a must as one training will not change traditional methods and design. Some participants, although gladly acknowledging that they learned a lot were still sticking to the old methods, because 'that is what the fishers want, that suits the local circumstances, those materials are easily available.'*[33]

***In control: community participation.*** *Several funding agencies work closely together with communities to asses the situation (mapping assets) and consult with the panglima laot before they start boat building activities. Using experienced local craftsman (if available and, building boats on the spot, they enable beneficiaries to check the process closely (IRC in Calang), even more so if craftsmen and fishers are jointly responsible for the project including for buying materials. Some examples can be found around Meulaboh, in Kuala Tadu under guidance of PAPAN, and Pucok Luang with YPK, as well as on the east coast in Pidie district (TdH in Pase Lhok), in Bireuen district (Permata in Curee Tunong) and Lhokseumawe (Sahara).*

**Changing gear: turning to the bigger crafts**

The major parties involved in fishery rehabilitation (DKP, BRR, FAO, ADB and Panglima Laot) all quote a target number of 6,000-6,500 boats for replacement. This figure is based on the assessed loss of 7,000 boats minus 10-15% representing the percentage of casualties among the fishers.[34] All agree that with an estimated 4,000 small boats built and in the process of being build, the required quantum has been reached, and stress it is now time to focus on the construction of larger boats, which until now only have been built in small numbers, as is indicated above in Table 7.[35]

Most organisations have kept the replacement of large boats at bay, not only because it is far more expensive, but more so because of the ownership dilemma. Helping the owner of a boat larger than 16 meters is perceived as helping the 'rich' employer, while neglecting his 'poor'

[33] The boat quality problem could have been addressed earlier. The FAO admitted it had problems funding the mission. The success of the intervention depends on long term guidance and support. For example, although everybody acknowledges that galvanised nails enhance the lifetime of a boat, few will use them because the nails need to be ordered from Medan, preferably in bulk, and they are far more expensive.

[34] Peter Flewwelling, the chief technical officer of FAO in Aceh quoted a replacement target of 6,000 boats, based on a 7,000 boats lost minus 15 percent, figures which were also quoted by BRR and the head of the Fisheries department in Aceh, although the latter put a more flexible target up to 6500. Earlier assessments mention around 10,000 boats lost and damaged and the revised figure only seems to account for the lost boats.

[35] BRR fisheries staff underlined that except for the around 4000 small boats which are built or in the process of being built, various agencies have expressed strong interested in adding a few thousand more (Social Welfare Department 2000, FAO 2400, BRR 2000 now reduced to less than 1000). These expressed intentions motivated BRR and its major partners to put a brake on small boat building and stimulate aid agencies to build larger vessels, as BRR itself is now also going to do (and ADB as well).

crew, although the crew will profit through employment and wages. Only now some agencies are planning to construct larger vessels.

In general the owners are left to find a solution themselves. Those with repairable damage depend largely on their families and friends to borrow money, while some look for investor support as banking credits seem beyond reach. Those who have lost their vessels have to accept their fate and start all over again.

The only option to secure funding from aid agencies for larger vessels is through cooperative management, by setting up a cooperative or likewise institution. Now that the target for small boats appears to have been reached, several agencies are exploring the organisational options. Some already have established cooperatives and other structures to ensure a more 'equal' distribution of profit. As mentioned earlier this intervention is strongly supported by the major players. FAO for example is entering collaboration with IFRC, with one of the IFRC country members, Belgium, already showing the way.[36]

At community level the shift of focus to larger vessels is criticized by local *panglima laot* and fishers alike, as many are still waiting for the replacement of the small boats. They are alarmed and upset by newspaper articles claiming that with 4,000 boats already being replaced no further small boats are needed. First of all, not all these 4,000 boats have been delivered as yet. Secondly, looking at sheer numbers these 4,000 new small boats do not add up to the loss of around 6,500 boats up to 16 meters long.[37]

The arguments in favour of the larger vessel policy look beyond the need of mere replacement of lost craft and bring in additional elements especially the need for developing capture fisheries in particular the 'underdeveloped' provincial deep sea fishery. With larger vessels the local fishing community would be able to tap the available off-shore fish resources like tuna. These, so runs the argument, offer export opportunities, create more employment, and at the same time help to prevent over fishing of coastal waters. According to some experts the catch already shows signs of depletion; others disagree. No scientific studies are yet available to asses the post-tsunami marine resources. The Indonesian Research Institute LIPI in collaboration with the Norwegian Institute of Marine Research has just completed a study on the ecological impact of the tsunami in the coastal waters. Their research includes no real stock assessment, although they identified coastal resources up to 80 meters deep, indicating a positive and quick post tsunami rehabilitation of coastal fish resources. A deep sea stock assessment is still pending, with some indicating that the WB is in the process of preparing that assessment. The Fisheries Department, BRR, FAO and other parties are eagerly waiting for the results, as the availability of deep sea resources will ultimately decide whether deep-sea fleet enlargement is feasible.

[36] The Belgium Red Cross will supply 17 purse seine boats (*labi-labi*) of 17 meters to the Meulaboh fishers community, which will be jointly managed by a cooperative. The latter is expected to have a membership of 300 fishers consisting mainly of pawangs and crew members (17 persons/boat). The plan to use an existing cooperative has been dropped as the old members are all boat-owners who wanted to be part of the new cooperative. The first five vessels, presently under construction in Lampulo, are expected to be delivered by the end of December. The Belgium Red Cross plans to supply another 8 *langar* boats of 23-25 meters to other regions like Sabang and Pidie. The projects cost respectively € 1 million and € 800.000

[37] Looking at the FAO loss assessment figures it turns out that only 100 of the 7,853 lost boats fall under the category of large boats, i.e. >16 meters. Even if the 12-16 meter 'C' size is taken in to account, the amount of small boats lost is around 6,000, of which 5,000 would need to be replaced (according to the FAO formula of a 10-15% reduction for loss of live).

**Box 3: Good Initiatives – Striving for Transparent Cooperative Management**

***From cooperative to village-based resource management***
*The wave of tsunami aid has brought a whole range of cooperative management concepts to Aceh: many still only on paper but a few are already brought to practice, though it is too early to judge their feasibility and sustainability.*

***Fishers cooperative: joint ownership***
*The 40 fishers strong Putra Pantai cooperative[38] in Curee Tunong (Bireuen) is about to become the owner of a 20 meter long purse seine vessel, which they will operate in shifts. Presently the fishers are all busy mending nets and keeping an eye on the boat builder's work. In due time they hope to acquire a second purse seine boat using the income the cooperative will generate as 'boat-owner' and its credit fund. In Meulaboh fishers will be establishing a far bigger cooperative that will manage 17 vessels with the help of a professional management team, which is also supposed to take care of the marketing of the fish.*

***Village cooperative: profit sharing and revolving fund***
*In Lambada (BA) the first 50 owners of new boats (17 privately owned, 6 owned by two persons and one owned by a crew of 15) provide the basic income of the revived village cooperative, which has saving and credit as its main activity.*[39] *The fishers contribute a share of the profit to the coop, money that will later be used as a revolving fund to buy more boats and to set up a shop (warung logistik) to sell fisheries equipment. Micro credit with a transparent accountancy system is seen as a key to reduce dependency on traders cum moneylenders.*

***Community Finance Institute: a more flexible credit institution***
*The crew of the new purse seine boat in Lancang (Pidie) can now borrow its operating cost against a five percent from the Community Finance Institute (Lembaga Keuangan Masyarakat). That's five percent less than the trader cum moneylender would ask. The newly established institute works actually as a village cooperative, but is not bound by the strict cooperative rules and regulations. Instead it can develop its own rules as and when required. ICD, a local NGO, has recently set up 5 such institutes in as many villages in the Kembang Tanjung district. The communities all received some boats and will contribute part of their profit as starting capital for the community finance institute.*

***Community Economic Institute: community resource management***
*The villagers of Lhok Bubon and Pucok Lueng in Meulaboh district have recently established their own village-based institutes called Lembaga Ekonomi Masyarakat or LEM. These institutes provide a single window for aid agencies intending to work in the area, thus ensuring community participation and control. The institutes aim to manage all economic activities as a 'village enterprise', with a cooperative management team[40] of elected members and separate division heads, representing the various economic sectors active in the village (fisheries, agriculture,*

[38] The cooperative was established last year just before the tsunami by the local farmers' organisation Permata. The cooperative in Meulaboh which is supported by the Belgium Red Cross will be newly established to avoid the debt burden of the old boat-owners cooperative.
[39] The local fishers community is supported by the Banda Aceh based NGO Pugar, who also helped to secure funds for several boats. Similar initiatives can be found in other places, like in Jeumurang in Pidie (TdH/SHMI).
[40] Staff payment remain an source of dispute, with one management team preferring regular salaries while the other would prefer sector heads generating their own income, for example through profit sharing such as having the head of fisheries manage the fuel pump at the landing site.

*home industries, trade etc). Micro funding is a crucial activity as it generates money (through interest) and at the same time supports various economic activities, providing access to credit. The village organization's micro fund is also meant to provide 'insurance-loans' to pay hospital bills, and improve people's welfare by investing in training, education and social activities. Some income is already generated through joint management of boats and boat building (profit sharing), hand tractors and tools (rental), sale of fuel. Future sources of income could include: management of fish landing sites, ice plants, fish auction and petrol pump (percentage of sale or tender right), group-owned fish pond or farmland.*

*The organisation's recently built village office serves as a meeting and information point. The proposed designs for new houses and a village scale model are put on display here. The ultimate goal is village-based resource management.*

**The second priority: Fisheries Infrastructure**

First provide the boats and only then the infrastructure, is the most common approach followed in the reconstruction of capture fisheries in Aceh. As of writing this report, the first infrastructure projects have commenced, but most of them are still in a planning stage with implementation only to start in 2006-2007. Integrated infrastructure projects are relatively expensive, with estimated cost estimates ranging from US$ 100,000 for a small landing centre up to US$ 400.000 for rehabilitation of larger harbours. Only the bigger aid agencies have the funds to finance and hire the required expertise for this kind of infrastructure development. Furthermore, most non-governmental organisations view these kinds of infrastructure projects as the responsibility of the government, as it concerns public facilities.

ADB and FAO have stepped forward as strategic partners in rebuilding the severely damaged infrastructure in collaboration with the Fisheries Department. ADB's current plans include support for the development of between 12 and 18 small-scale landing places through an integrated approach, i.e. designing landing sites, icing, storage facilities, refuelling facilities and also post-harvest facilities. The ADB project has not yet started due to bureaucratic delays in budget allocation and release.[41]

Minor rehabilitation and reconstruction of fisheries infrastructure is already being implemented in order to kick-start the production process. Various INGOs made a head start with clearing debris through cash for work programmes. In some cases this has been followed up with the construction of market sheds or small mosques on the beach or close to landing sites, which double as meeting places.

Until now some 130 fish markets have been constructed, with a further 156 planned, according to BRR data.[42] Information regarding reconstruction of landing sites is less easily available and we therefore have to limit ourselves to a few places were we know work has started, like in Ulee Lheue. Here, at the request of the *Panglima Laot* the aid agency Islamic Relief is building a landing pier for the five purse seine boats that survived the tsunami. Other sites will follow,

[41] The ADB Fisheries project comprises six subcomponents, namely: (i) community empowerment; (ii) rehabilitation of small-scale capture fisheries; (iii) rehabilitation of aquaculture and mariculture facilities and production systems; (iv) rehabilitation of small-scale fish landings and post-harvest facilities; (v) coastal resource rehabilitation; and (vi) support services restoration and provision. The project will take three years, with a budget of US$ 30 million.

[42] BRR presentation Mr. Kuntoro Jakarta, 28 November 2005

according to BRR, but it will take time to build permanent facilities as they have to comply with the minimum standards, including providing for solid waste management and ice facilities.

To meet immediate needs and prevent that fishers have to wait till full-fledged landing sites have been completed, FAO proposes to build small so-called container ice plants. One 3-5 t/d capacity ice plant is being procured by FAO, while the government will provide a 1 t/d ice facility. Some aid agencies like IRC now also start focusing on supporting infrastructure now that they have rounded off their boat building activities.[43] IRC is currently discussing with local fishers in Calang what kind of support they need to strengthen their economic activities, be it an ice plant, fish processing equipment, transport or working capital for fish vendors. ICR plans to channel that support through local cooperatives to encourage cooperation between local groups.

**Aquaculture Infrastructure**

Interventions in the field of aqua culture are only starting now. The only exception being the cash for work programmes to clear the debris from thousands of hectares of embankment area, which started within a few month of the tsunami. However, far more needs to be done to turn the cleaned ponds into productive ponds. The FAO sums it all up in its booklet '15 Steps for Aquaculture Farm Rehabilitation in Aceh, Indonesia'.[44] Rehabilitation turns out be a complex process for a combination of reasons. First of all, one needs to rebuild the infrastructure of a larger embankment area before one can start rebuilding individual ponds. The overall irrigation system of water canals and watergates needs to be repaired before separate dykes are rebuilt and sludge is removed. Secondly, rehabilitation is an expensive affair, with a minimum cost of around US$ 100.000 per village area, based on average cost of US$ 1,800 per hectare.[45] Thirdly, it involves complex ownership patterns, involving both private and public or common properties, further complicated by issues of indebtness and owner-worker relations. Fourth, the social and economic importance of aquaculture cannot cancel out its negative impact on the environment and the fact that it caused the destruction of protective mangrove forests.

The FAO booklet is an obvious effort to address all the above mentioned issues and to ensure the reconstruction process will help overcome problems that already existed before the tsunami and result in improvements regarding technical, economic, social and environmental aspects. Still, many aid agencies keep their distance and postpone their activities in the aquaculture sector. In addition, the organisations who are involved in aquaculture interventions mostly seem to do so in an uncoordinated manner.

Exact data on the extent of the rehabilitated embankments are not available. Some owners have started reconstruction on their own effort, often with financial help of family members. Others got some support from aid agencies or the government to rebuild the irrigation cannels and for renting proclainers to reconstruct the dykes. Few organisations took it upon them to fully fund the rehabilitation of aquaculture for a whole village, let alone addressing all the technical, social, economic and environmental issues involved. In Sangso in Pidie district Terre des Hommes, The

[43] IRC has built and repaired a total of 340 boats in Calang in collaboration with the *panglima laot*. In the follow-up phase IRC plans to provide phase-wise budget support to local cooperatives up to €40,000.

[44] The booklet is a joint project of FAO, Aceh's Aquaculture Training Centre of the Fisheries Department and the Australian government. The booklet was published in October, an indication that interventions in aquaculture started late. Furthermore very few local NGOs were aware of the existence of the FAO booklets, including the one on boat building. FAO printed 300 copies and has now started a distribution campaign, handing out soft copies.

[45] The quoted figures are taken from a project proposal of YBK for TdH Netherlands in March 2005, for the rehabilitation of 67 hectares shrimp ponds in Sangso, Samalanga district, based on a 'one hectare-pond per owner' approach, including working capital to buy seedlings and feed.

Netherlands (TdH) ensured that the owner of the pond will share a larger part of the profit with the workers. Walhi partner Yasindo, which is working in the neighbouring Jangka Buaya subdistrict paid more attention to the environmental issue by planting single rows of mangrove samplings along the dykes to strengthen the embankment[46]. Walhi itself wants to introduce silvofisheries as a way to promote sustainable aquaculture. In all, on the ground one encounters a diverse mix of interventions. This might change once larger scale intervention programmes start like the ADB.

**Post harvest fishery-based livelihoods**

Livelihood support is one of the most popular intervention strategies as part of post-tsunami aid. It scores well with all parties involved, both governmental and non governmental, small and big organisations. Supporting fish processors, fish traders and salt farmers is one of the obvious choices if one is to rehabilitate the affected coastal communities. Even so, during field visits these groups still complained a lot about the absence of financial support or its limited scale.

Fish processing is restricted to certain coastal centres where a substantial number of vessels equipped with 'anchovies nets' are active to supply the required small anchovies or *ikan teri*. Elsewhere, people will only occasionally engage in fish processing, i.e. mostly when fishers encounter difficulties to sell the fresh fish, mostly due to an abundance of fish. In those cases the fish is either salted or dried to keep it from going waste and to reduce the loss of income. Generally, only the processing of the small dried *ikan teri* is perceived as commercially viable. That is also underlined by the fact that the big fish traders and exporters in Medan -active in the *ikan teri* trade- were among the first to provide aid to their loyal suppliers as to keep the business going.[47] In other places like in Leupung, the traders from Banda Aceh and Medan are the ones who own all or most of the vessels.

Interventions in fish processing mostly aim at replacement of lost infrastructure and equipment: i.e. a shed for cooking and storage, stove and pots, drying racks and baskets.[48] However, fish processing also requires working capital as processors double as traders; buying fresh fish from the fishers before they can sell the processed fish to the merchants in Medan. FAO is now considering providing working capital, but given its restricted funds for the time being it will retain its focus on providing physical inputs. FAO has also plans to organise training to improve the quality of processing as well as bookkeeping.

FAO has so far rehabilitated 189 fish processing units in four districts. In Pante Raja it has mainly provided aid to the larger units, arguing that they provide more employment than the smaller ones. The 45 beneficiaries who on the average had a capacity of 200 to 500 drying racks have each received 100 drying racks from FAO, thus they are still operating well below their normal capacity. They used to employ 4 to 8 workers each, while smaller units employ 2 to 4 persons, mainly women.

[46] Others claim that planting mangrove on the embankment leads to seepages and may therefore not be acceptable fishpond-farmers.

[47] Pak Uji, the owner of 'Nusa Indah' in Medan, was one of the first people to provide food aid to his suppliers in Pante Raja on the third day after the tsunami. He also provided them with working capital (average € 200) and mobile phones, which they have to pay back in instalments with each delivery of *ikan teri*.

[48] Local consumers prefer uncooked dried fish, but for the export market only boiled dried fish will do. Fish processors in Panta Raja produce both.

Elsewhere, some fish processing units received only part of the equipment and were thus unable to start working.[49]

Support for fish traders consist mainly of replacement of transport, mostly motorbikes, insulated ice boxes and pannier baskets, as well as working capital. While some organisations like FAO specifically target fish traders in certain pockets, others like Oxfam provide working capital to fish traders as part of a general economic recovery package which also is targeting food stall owners and craftsmen. Overall, the interventions targeting fish traders lack coordination: some get help and others don't, depending on the priorities set by the organisations working in the area and not based on the needs of the people or the requirements to revive a specific economic activity.

Salt workers are more specifically targeted, because just as fish processors they are heavily concentrated in certain areas. In various locations along the east coast salt farmers have been provided with sheds and cooking equipment so they can start working again[50].

## 3.4 Interventions specifically aimed at women and other vulnerable groups

Women are the key to a new Aceh, underlines Mr Kuntoro, the head of the BRR, stressing the 'strategic value' of women. However, fisheries are perceived as a sector dominated by men and thus most interventions are targeting male fish workers. While every single organisation active in the rehabilitation of fish processing will stress that women are among the main beneficiaries, most of them shy away from exclusively targeting women in this sector, not wanting to deny men the same opportunity.

On the ground, fisheries in Aceh are indeed men's business.[51] Women only participate in few fishery related activities, and none of these are an exclusive women's domain. While women form the major workforce in the fish processing sector, and often is the only source of income for female headed households, the entrepreneurs are mainly men and husband and wife teams. The same goes for salt farmers, who mostly operate as a family business. Though women certainly benefit from the interventions in fish processing and fish marketing as well as salt farming, the large group of women do so only indirectly, through the revival of employment opportunities. The working relations in the sector as such remain unchanged. Aid agencies neither target their support for family related fisheries business to strengthen the position of women as an equal partner. However, more in general most agencies ensure that women are included as beneficiaries of the livelihood programmes, as recipients of working capital and tools to enable them also to earn an income, though mostly in sectors which fall in line with the 'traditional' female activities like sewing clothes, baking and selling of cake and other food products.

[49] In Jeumerang in Pidie district the fish processors receive JICA support through ICD, a local NGO. When visited the sheds and stoves were already in place, but of no use as yet since the processors didn't have any cooking pans nor drying racks to process the fish, complaining that the local boats were forced to sell their catch in the neighbouring Pante Raja. According to ICD the delay was due to fact that the cooking equipment had to be ordered in Medan.

[50] UNDP has rehabilitated 50 hectares of salt pans in Pidie district, with the help of cash for work, involving around 2000 people, according to own press release. While travelling in Pidie district I noticed several clusters of new salt cooking sheds.

[51] The local NGO Paska in Pidie has introduced a rule that the male beneficiaries of their boat programme have to pay a weekly contribution (Rp 5,000) to the widows in the village. In this way widows receive some working capital to invest in their *pandan* mat weaving home industry.

Interventions are in general more focused on the rather broadly defined target group of 'poor' people, which usually covers both the structurally poor and those whose poverty is directly related to the impact of the tsunami. With most assets in coastal areas destroyed by the tsunami, there is a high degree of impoverishment among formerly better off and middle class families. In line with their pro-poor and equity approach, agencies generally opt to provide the same basic assistance for all affected people. Although equal treatment is not always feasible, especially regarding livelihood interventions, there is a clear tendency to treat all tsunami affected sub-groups equally: all affected fishers tend to receive the same small boat, all fish vendors the same amount of capital, with no extra compensation for the 'rich' boat owners and traders.

The far more complex ground realities force agencies to review and refine their strategies. FAO for example decided to provide support to the largest units of fish processing, thus supporting the relatively richer entrepreneurs as they have the potential for generating more employment for female workers, while the smaller fish processing units, are still waiting for aid. Many perceive this as unequal treatment and thus it forms a potential source of conflict[52]. BRR promotes a more 'equal' practical approach regarding aquaculture by trying to help rehabilitate as many shrimp farmers as possible (each with one pond, both poor and rich), while indirectly ensuring employment for aquaculture labourers as well.

## 3.5 Rehabilitation of fishing communities: Land and Shelter Issues

All settlements along the 800 kilometres of devastated coastline in Aceh harbour larger or smaller fishing communities. In each and every of the 650 affected villages and towns the fishing communities have been hard hit by the tsunami as they are the ones living closest to the sea. However, no separate data are available regarding fishing communities, as they are not treated as a specific statistic entity but seen as an integral part of a mixed village community. While in many small coastal villages the majority of the people depend on fisheries, there will always be a few craftsmen, traders and farmers as well. In bigger towns the situation will be reversed, just like in Banda Aceh where the majority of the affected population works in the service sector. In all, it seems safe to assume that more than half of the 540.000 people rendered homeless by the tsunami belong to households depending at least partially on fisheries for their livelihood.[53]

**Number of fishing villages affected and infrastructure**

According to BRR data approximately 650 villages have been affected of which more than half, i.e. 340 villages have suffered severe damages. The worst hit are the villages on the west coast of Aceh from Meulaboh up to Lhok Nga and Banda Aceh, with Calang town standing out as the worst affected place with just one single house left, and even that is damaged. On the northeast coast most seashore villages have also been swept away, but further south on the east coast one finds more settlements that have only partially been damaged. On Nias an estimated 80 coastal villages are affected, leaving more than 40,000 people homeless. Given the damage BRR estimates around 120,000 new homes are required, some 80,000 to 110,000 in Aceh and 13,500

[52] Part of the problem is that they formed three groups of processing units, one being exclusively male entrepreneurs. One women group was selected as beneficiary for the FAO project, the others would be helped by the fisheries department (according to FAO), but that help has not been materialised. In the meantime the original composition of the group has changed excluding smaller entrepreneurs and adding bigger ones. Heated protests occurred and the panglima laot –himself a processing entrepreneur- had to intervene, more or less covering up the whole affair.

[53] According to MMAF statistics there are around 87,000 fulltime and part-time fishers in the affected areas, which multiplied by four (household members) ads up to more than 300,000 people.

on Nias.[54] With around 80,000 hectare of land now submerged or uninhabitable, around 30,000 land plots are no longer fit for habitation. Thus a quarter of the homeless need new land for their homes.

Just like the houses and villages the infrastructure damage is immense[55]:

- 3,000 kilometre of roads were rendered impassable, among which 600 km of arterial roads, 650 km of city roads and 1,360 km of local neighbourhood roads
- 120 arterial bridges and 1,500 minor bridges were destroyed
- 8 out of 10 airports were damaged
- 14 out of 19 seaports were badly damaged
- 2,700 school buildings were damaged of which 366 need to be replaced
- 122 health care centres were damaged or destroyed
- more than 500 religious facilities were severely damaged (mosques, prayer halls and Islamic schools and boarding schools)

**Reconstruction progress and relocation**

Shelter and housing have been named the first priority in the reconstruction effort, but so far progress has been slow. By the end of 2005, BRR hopes a quarter of the required 120,000 new houses will be ready. At present 16,500 houses have already been built with another 13,000 being under construction. BRR plans to speed up the process next year, targeting to build 78,000 houses before the end of 2006. By March 2007, all the required 120,000 new houses should be ready.

At present, a large part of the more than 500,000 homeless found temporary accommodation with family and friends or built their own huts. Close to 70,000 people still live in tents, while another 75,000 stay in 'organised' barracks that are provided by government and aid agencies. The initial plan to relocate all displaced people to barracks was abandoned after fierce criticism from the affected communities, especially from the fishing communities. With coastal areas still being partly submerged and roads and bridges damaged, those barracks were planned to be built far away from the village of origin. Too far, according to the communities, who were afraid to be cut off from their source of income (sea and farmland) and the only asset they had left, their own piece of land. In some cases the government therefore opted to locate barracks closer to the affected villages. In other cases the villagers chose to return to their villages and build their own huts. The latter option has often been treated as the end of their 'displacement', thus meaning the end of the monthly supply of food rations and living allowance.[56] To avoid being left in the cold some families split up with some members continuing to live in the barracks in order to claim the rations and others returning to the village to reclaim their land.

[54] All BRR data taken from Tsunami Recovery Status Report, December 14th 2005. While BRR reports 650 affected villages, Oxfam and others still use a 'rounded up' figure of thousand affected villages and towns - as quoted by Oxfam's Briefing Note on shelter, also dated December 14 - dating from an early damage assessment.

[55] BRR, Tsunami Recovery Status Report, December 2005

[56] The WFP is in charge of the monthly food supplies, which according to the standards consists of 12 kg rice per person, plus a certain amount of cooking oil, instant noodles and canned fish. Other agencies have been explicitly asked to stop providing food supplies after six month. The living allowance of Rp 90,000. per month per person (9 dollars) is the responsibility of the provincial government. It is not as well organized as the food supplies. The allowances are not regularly handed out and people sometimes are just passed over without any clarification. There are no clear rules whether returned villagers are entitled to food rations and a living allowance: some get it and others don't and some get just one or the other, but not all. Most local aid workers don't know what the rules are and when the additional food aid will stop.

**Right to return**

Initially the government proposed to have a two-kilometre coastal safety zone, where no construction would be allowed. This plan was successfully opposed by the communities living within the two-kilometre zone, who demanded the right to return to their land.[57] However, it took the government a few months to take a decision, which caused considerable delay in the housing projects as UN agencies and many other international donors did not want to build houses without formal government permission. This is highlighted by the fact that the houses constructed so far have been built by comparatively small agencies, mostly those with a project size of less than thousand houses.

Officially now all IDPs are entitled to return to their place of former residence if they chose so. [58] However, relocation remains an issue as around 80,000 hectares of land is now submerged or uninhabitable. This means thousands of households have to be relocated. In some villages were only a few households had to relocate; they have themselves made arrangements, using village land or swapping plots. Elsewhere the (sub) district government has bought land for those who have lost their land to the sea.[59] Most aid agencies keep their distance and do not want to get involved in land sales, foremost because of the disputes surrounding landownership and land titles, but also because they fear it will lead to inflated prices.[60]

In some cases the local government has claimed former private coastal land for public use. Both in Calang and Meulaboh local authorities developed plans to use some land for coastal development, i.e. for a harbour and tsunami monument in Meulaboh and for the relocation of the complete town of Calang, which was totally destroyed by the tsunami. In Meulaboh this claim is disputed by the private owners, as the government remains unclear about the place and arrangements for relocation.

Delays in the construction process are also caused by problems surrounding land ownership as documents have been destroyed, both those privately kept as well as those of the government land registration agency (BPN). In small communities which have a large group of survivors the public memory can still be tapped to re-establish borders and ownerships rights. Government accepts ownership letters acknowledged by the community and BPN will provide them with new land certificates.[61] In some places there have been complaints that the process takes a lot of time, with officials claiming payment although the service should be free.[62] The big problems, however,

[57] Uplink and its network of 23 villages near Banda Aceh played a crucial role, as is described in the box Best Practices: Community Participation.

[58] Most people opt to return, but for some it is a forced choice with no other options at hand as there is no other plot of land available a little further from the sea.

[59] The Lancoek leprosy colony in Samudra Pase subdistrict near Lhokseumawe got relocated, but the negotiations on the sale of land took a long time, in this case it was not just the price but also the fear factor that caused problems. In the nearby Seunnodon the subdistrict government already bought land to relocate half of the villagers of Bantayan. In Lamreh near Banda Aceh government land (Bukit Soeharto) has been allocated for those who lost their land, including those who where living on somebody else's land..

[60] JRS has helped the surviving villagers of Lamsenia in Leupung subdistrict near to Lhok Nga to buy land at the foot of the hill, where UN Habitat and Oxfam will build the houses.

[61] BRR has issued guidelines for a participatory approach to restore property rights, requiring communities to map their village, decide on inheritance rights per plot which are then processed by BPN, making detailed maps and hand out documents. BPN received funds for a land registration project, with Japan supporting efforts to restore cadastral documents which were damaged by floodwater and mud.

[62] The Asia Foundation lists several complaints in its 'Aceh Rehabilitation and Reconstruction Appraisal (ARRA), with document replacement mechanism inappropriate to actual post-disaster conditions, lack of proper facilities and complex requirements.

arise in the devastated suburbs of Banda Aceh that were densely populated. Here only a fraction of the inhabitants survived. It is therefore far more difficult to establish ownership rights, especially since most of the landmarks have disappeared. It is in these areas that least progress has been made.

**Participation, minimum standards and scientific norms**

BRR dictates a community driven approach, to ensure community participation. Until September, some twenty international and local NGOs had initiated work on did land mapping in 94 villages. Mapping was followed by village-level spatial planning, including site planning and detailed engineering designs for public infrastructure like roads, drainage, clean water and sewage networks. This is how it should be done: having group discussions and setting up a village steering committee that acts as a partner for discussion, for data collection and verification discussion, for design and implementation. The UNDP set up a Small Grant Programme to support local NGOs with the mapping and planning exercise, while INGOs like TdH and Hivos enlisted an experienced Indonesian support NGO to assist local organisations in the field.[63] Other examples can be found in the Best Practices Box.

In a significant number of other villages the housing reconstruction process is far less participatory. Some organisations do the job themselves with the help of a contractor and just hand over the key, while others only consult a selected group of key figures.[64]

Building model houses has become standard practice for many agencies in order to ensure that basic safety and quality standards are in place while giving the community a voice in the design. In practice it often means the community has just a restricted choice between two or three models, which many feel obliged to accept because it is a gift and they will anyway loose the discussion with the 'experts' on technical arguments on safety.

In the first months several agencies designed and promoted earthquake-resistant houses, putting up posters to inform the broader public of the essential safety measures like the required diameter of iron rods and the depth of the foundation. Wooden houses on stilts belonged to the favoured designs promoted by international agencies as they were seen to provide some safety against a future tsunami or springtide and at the same time reduce risks of injury as wood is a relatively light material. However, due to the issue of illegal logging this type of designs has silently been dropped. Most agencies have severely cut down on use of timber for housing, replacing it mostly with bricks. This design is much preferred by the communities, as they perceive a brick structure as being more 'permanent' (read durable) than a wooden structure, certainly with the present decreasing quality of timber. [65]

[63] YPK from Meulaboh was one of the NGOs supported with the GESSGP fund set up by UNDP, resulting in the establishment of LEMs, Community Economic Institutes. LPTP from Solo is assisting local partners of TdH and Hivos in several villages in Pidie, Bireuen and North Aceh districts.

[64] The villagers of Janguet near Lamno claim they have merely received the keys from the Turkish organisation that rebuild their houses, although they were obviously consulted about the land ownership. Now they don't know where to complain about the leakages (they just wrap the outer walls in plastic) and about the houses which are yet to be built. Beneficiaries of IOM's temporary shelter just needed to sign for the key receipt and have no clue about their permanent houses: 'Just ask the village head'. It's a response one hears very often. 'Small people' as they call themselves, leave the talking to the 'big' people and don't dare to ask questions.

[65] Complaints about the quality of timber are heard all over Aceh, mostly due to the drying process and the hardness of the type of wood. The involvement of security personnel in timber mills, transport and delivery forces aid workers and communities to 'accept' the lesser quality, not daring to reject the supplied wood.

The official BRR guidelines and standards for shelter are minimum standards and do not address all the safety issues and scientific norms. Even so, some of these minimum requirements are not being observed in various housing projects. The wide variety in quality, style and type of housing highlights the problem. The minimum prescribed standard size of houses is set at 36 $m^2$, but various agencies ignore the regulation, some building houses as small as 27$m^2$ while the most spacious ones count 70$m^2$. [66] The lucky ones get a kitchen block and a tiled floor; the unlucky ones have to live with triplex walls. People often lack information on the minimum standards, although the UN-Habitat claims to have distributed 100,000 leaflets via BRR.

Providing shelter is more than just building a house, underlined BRR head Kuntoro while highlighting the shortcomings in water and sanitation. These shortcomings are due to lack of clear guidelines, coordination, monitoring and control. Some NGOs just focus on a quick solution[67], while elsewhere various organisations are active and the reconstruction process is divided sector-wise (i.e., shelter, water & sanitation, schools) without much collaboration.

**Box 4: Best practices – participatory approach**

***Being there***
*In overwhelming sad and chaotic times, the few returning displaced villagers of Lam Ujung near Darussalam were happy just to have somebody around to consult, helping them to sort out what they wanted, where to get it, whom to approach. A student activist of People's Crisis Centre (PCC) regularly stayed with them in the destroyed village, guiding them on how to cope with all these aid organisations and get the support needed for the others to return to the village. Although PCC also provided food aid, it was the moral support that made the difference.*

***Village mapping and planning***
*Reconstructing the old village on paper together with the survivors is the first step towards the construction of a new village. LPTP usually takes three to five days for the public exercise, but preparations start much earlier with compilation of village data. The actual map helps to verify the data (Who had a boat? Who owned this fishpond? How big was this plot of land?) as it is for all to see. A second map helps to visualise the new village layout and indicates who wants or needs to relocate, and how it will be arranged. The next step is the actual marking of the separate building plots. A core group of villagers represent the community to work with the NGO housing team on the housing design and construction process.*

***One step further: resource mapping***
*YPK uses the village mapping exercise not only to map houses and infrastructure, but also to asses the natural resources for present and future economic activities. The exercise creates awareness about potential resources within the framework of sustainable livelihoods, thus building a base for community-based resource management.*

***Going the whole way: from emergency aid to a network of eco villages***
'Udeep Beusaree', *Living Together is the motto of the 23 Meuraxa communities that are supported by Uplink. By providing food support Uplink stimulated people to return to their*

[66] Figures quoted from The Asia Foundation ARRA appraisal. In Meulaboh CRS is building standard houses of 45 m2, while Help in Seunuddon .
[67] Villagers of Lhok Phuk in Seunuddon tired of waiting for houses promised by CORDAID, happily accepted the quick fix from the Yogyakarta-based YEU, who just provided timber and money to pay the construction workers. It turned out to be bad deal: low quality timber and low investment (1,000 dollar per house) with no extra facilities.

*villages, set up community kitchens and build their own barracks. Focusing on one area Uplink gradually created a network of 23 villages. With the help of architects and planners from Jakarta the villagers started mapping the sites for their new homes, looking for alternative solutions to address the safety issue (artificial hills, escape roads). They played a crucial role in the reversal of the planned safety buffer, gaining the support of the minister for the environment as a pilot project of Eco Villages. Now they have started reconstructing their villages, the rich neighbours are also returning to rebuild their houses. With their own money.*

# 4 Key issues

**The quality of Aid: How to ensure that people get helped well?**

The quality of boats is sometimes dangerously poor due to various reasons: use of bad quality materials, lack of craftsmanship and technical know-how, designs that are not suited for local conditions. Less life threatening is an incomplete boat, but with just a boat and neither gear nor engine fishers are still unable to go back to the sea and earn their own living. These quality problems have been highlighted by various organisations, including FAO, Panglima Laot and BRR. More community involvement certainly helps reducing the problem, just as better training and extension work will improve the quality of aid by extending the lifetime of a boat. But how to ensure minimum quality standards with so many players in the field? And who takes responsibility for past mistakes? What about the people who got a leaking boat or no nets? Or a leaking house for that matter. In housing one also encounters a wide variety in quality, size and style of shelter, despite minimum standards. More information on minimum standards and rights can empower local communities, but without a clear complaint mechanism their criticism often remains unheard.

**The quantity of Aid: Danger of oversupply and depletion of resources**

Small boats turn out to be an attractive 'quick fix' for many aid organisations: it provides highly visible aid which is easy to provide and relatively cheap. The small boats not only help fishers but also the aid organisations that are under pressure to digest unprecedented large amounts of donations in a short timeframe. With around 4,000 boats delivered and more under construction, experts fear an oversupply of small boats which in turn can deplete available resources in the coastal areas and thus endanger a sustainable development of the fishery sector. Shifting focus to larger boats, especially those equipped for deep sea fishing and multiple-day trips is being promoted as an alternative. However, the scientific justification for this strategy by way of resource assessments is still lacking. In the meantime aid agencies start showing interest in larger boat projects, under pressure from donors to spend more money, but also to generate future employment opportunities.

The quantity issue also colours the discussion on infrastructure. Government officials' tendency to go for big infrastructure projects is sometimes more motivated by opportunities to generate some money for themselves than fine tuned to the local needs. People are often better off with ten small ice plants than one big plant.

**The Question of Coordination**

With so many organisations operating in Aceh and so much donor money around, coordination is severely hampered. BRR is established to do the job, but it is not yet in full control, despite its being backed up by a steering committee of the major parties involved (ADB, FAO, Panglima Laot and INGOs). Other mechanisms are needed to improve coordination of aid in the field, which also can serve as an 'early warning system' to detect and mend problems related to the

quantity and quality of aid. Community Driven Aid sounds good on paper, but in practice it is not easy, less so for the communities themselves who are overwhelmed by the sheer number of organisations offering piecemeal assistance. Their 'partners in development' - the local NGOs - are often co-opted as service-providers for INGOs. The long-term armed conflict has had a devastating impact on the capacity of local organisations, as it has hampered their freedom of movement, membership, contact with communities, networks, and capacity development. Many local leaders have been silenced, many promising activists have left. The Panglima Laot survived and is now being treated like a 'Prima Dona' as one activist puts it. But it might die an early death due to an overload of responsibilities and aid money involved.

After the initial frustration of endless coordination meetings and the pressure to start 'doing something' it may now be time again to have a second look at the coordination issue and the role and limitations of the various parties involved.

**Who comes first? Potential social conflicts**

With the huge demand for aid not everybody can be served at the same time. Most people accept this, at least to a certain extent, as their fate. Although people may envy other villages for being helped faster or receiving better quality housing or boats, the most potential source of conflict is when the immediate neighbouring household receives additional benefits. Checking and rechecking of information is essential to prevent aid going to the wrong group or individuals. Community involvement is a must, but does not necessarily offer a solution for everything. Influential people may take advantage of benefits, forcing others to consent. When everybody has lost everything is it difficult to judge who is more entitled to aid than others: the widow with two small kids, or the intact family with six kids? The big well connected trader who can employ ten people or the small trader who employs just two, but is fully dependent on aid? While people in the beginning were happy with whatever aid they received, they now become more critical as established pre-tsunami hierarchies re-emerge.

**Local Logging: Illegal or justified?**

Illegal logging has been rampant in Aceh, protected by practices of corruption and the established interest of so-called '*oknums*' (individuals) within the police force, army, and the bureaucracy. Environmentalists are now gaining ground in their effort to put an end to illegal or semi-legal logging, supported by the presence of international agencies. While a logging moratorium put an official end to local logging permits, illegal logging practices continue although in a more limited way. With all the reconstruction going on local villagers often feel justified to cut down 'some' trees for local use, for boat building as well as housing. Some aid workers silently condone this, arguing that it is pointless to pay a triple price for imported legal timber which anyway could also originate from the neighbouring village, pointing at the existing paper fraud. By allowing timber to be imported without import duties does not solve the problem, but only makes local people more vulnerable.

The issue of logging highlights the tense relation between reconstruction and environment issues. While rehabilitation offers a change to address long neglected environment issues, the urge to get back to normal life promotes a more short term practical approach.

**Cashing in on Social Responsibilities**

Generating income opportunities in the reconstruction process resulted in various cash for work programmes, especially in the initial relief phase when clearing debris was a priority. Now people want cash for everything, is an often heard complaint. Even the local term for community work, *gotong royong* has become a synonym to paid work. Although this might be temporary, given the

emergency situation, attention needs to be paid to traditional ways of community service and social responsibilities. In village planning the relocation issue can be addressed as a community issue, looking at communal land for a solution or start a lobby together for those who have become landless. One should be cautious not to pay for all social services and avoid reducing local institutes like panglima laot into service providers.

**The Cooperative Allergy: Looking for suitable alternatives**

The jokes about the local acronym for a cooperative, KUD, highlight the malfunctioning of the local cooperatives. In the past they were used as milk cows by government officials and their cronies at the expense of the local communities. But the concept of cooperative management still appeals to many, the need for a local source of easily accessible finance is still huge. Furthermore, with all the aid coming in, cooperative management can contribute to overcoming problems of 'unequal' individual ownership and strengthening local institutions. While some make use of the existing legal framework of cooperatives, others are looking for alternatives that are less prone to government interference and offer more flexibility to respond to local needs. Some started experimenting with new approaches like village based resource management. A more comprehensive effort to compare the institutional alternatives and analyse their scope and feasibility is still lacking.

**Striving for utopia? Cutting out the middlemen**

Making things better. The silver lining of the tsunami destruction is that it also offers an opportunity for rebuilding Aceh in a better way. However, the urge to start reconstruction work at the earliest often leaves insufficient time for a good strategic planning. Furthermore, established social patterns cannot be changed overnight. All strive to strengthen the position of fishers, making them less dependent on local traders cum moneylenders. Cutting out the middleman sounds like a good solution, but it may take a long time to achieve this and needs a long-term involvement of support organisations. Many organisations are still too pre-occupied with the present needs to look at the future and work on medium-term and long-term policies and plans.

# 5 Conclusions and Recommendations

**A fine balance - quick, good and participatory**

Given the scale of the damage, the rehabilitation of the tsunami affected fishing communities and their fisheries-based livelihoods is huge task in itself. Finding the right balance between speed, quality and community involvement has proven to be even more difficult. Several problems have already been highlighted; all are interrelated with the following issues:

- *Coordination and control*: The wide variety in quality, kind, size and strategy of interventions highlights the problem. Minimum standards and scientific norms are ignored and adjusted at will to the agenda and regulations from the agencies and institutes involved, with the beneficiaries at the receiving end.

- *Competition*: Hundreds of aid organisations are active in rehabilitation and reconstruction. Many have a lot of money to spend, and started claiming certain areas, putting up signboards and banners and signing MoUs with local governments. Some authorities take advantage of the situation, auctioning aid projects to the highest bidder with the fanciest designs. Local organisations depending on donor money are enlisted as service providers.

- *Complaints:* BRR is claiming the role of referee, handing out red cards to organisations and local governments that do not abide by the rules. However a complaint mechanism is still missing, with local communities often not knowing whom to address and where to go to register their protest and criticism.

**Challenging times ahead**

Until now the post-tsunami interventions in fisheries have focused on the quick revival of fisheries activities, mainly through replacement of lost craft and gear, but also by providing tools, minor infrastructure and capital to get supporting sectors like fish processing and marketing going again. Next year much more project money will be available for fisheries, especially bilateral and multilateral funds channelled through government departments, the ADB project being a prime example. It will be crucial to get the rehabilitation process focused though a consolidated effort of all stakeholders with specific reference to the following issues.

*Filling the Gaps*

As the dust of the aid whirlwind is settling, those organisations and institutes with a longer term involvement need to asses and address the shortcomings in aid, not only helping those who have been left out, but also providing engines for the fishers who have only received boats and adding gear for all seasons. It would help when stakeholders together would draft an assessment list, to get comparable parameters leading to a detailed overview of gaps.

*Linking Local Initiatives and Regional Infrastructure Projects*

The groundwork done and the fundamentals laid by local groups and organisations often forms a good basis to develop further plans, by providing opportunities for accessing regional infrastructure projects. It means linking NGO initiatives to government funding, to prevent that some very promising and inspiring initiatives to get stuck halfway but instead help them becoming models for development of the fisheries sector.

*Bridging Short and Long Term Investment Plans*
Between the quick start and the completion of a full fledged landing pier there is a time consuming planning, design and construction process which should be bridged with projects focusing on the medium term. An integrated planning session with all the stakeholders involved is needed to develop a step-by-step approach for the development of fisheries infrastructure in line with the existing capacity and opportunities. Detailed plans are needed to develop a few larger boats into a deep sea fishing fleet and an export industry.

*Analysing Interventions on Cooperative Management*
Aid opens the door to cooperative management, promoting it as a model for channelling larger vessels, revolving funds and micro credit, and public infrastructure. Given the distrust against cooperatives, several initiatives are being developed to ensure a more transparent and effective way of cooperative management at the local level. The effectiveness and impact of the various models and strategies, including its legal implications, need to be analysed and should lead to more in-depth discussion on the issue of cooperative management.

*Strengthening Local Institutions*
Panglima Laot is one of the few traditional local institutions that survived the pressures of time and conflict. As a prime stakeholder in fisheries it deserves a central role in the rehabilitation process. However, some fear with that with all the money involved the rehabilitation activities could undermine its traditional role as a mediator of disputes. Major partners in fisheries should develop a common strategy together with both the local and provincial panglima laot to define their roles and responsibilities. Attention needs also be paid to capacity building to specific training, not only for the panglima laot but also for other community based organisations, like to newly started financial management institutes.

*Looking beyond Replacement to Sustainable Improvements*
The traditional small-scale fisheries sector offers ample opportunities for improvement. Modernisation of the fleet, infrastructure and marketing appear obvious choices, but all need to be sustainable as well and based on an assessment of the available natural resource base. Improvement in quality and life of boats offers a start, just like registration of vessels which would serve as a basis for registration of fish catch. Better fish processing tools and access to credit can also help to strengthen the position local traders in the export industry.

## Annex 1: TOR of ICSF Study

Study on post-tsunami rehabilitation of fishing communities and fisheries-based livelihoods in Indonesia

**Objectives of studies**

1) Provide an overview of interventions related to rehabilitation of fisheries-based livelihoods and analyze some of the key issues/ challenges arising from these

2) Provide an overview of land, shelter and reconstruction interventions specific to communities and issues arising

***Duration***
30 days in October and November 2005

***Outline (draft)***
***Background information:***
Pre-tsunami realities along the coast (issues related to coastal and fisheries management, socio-economic development of fishing communities etc.)

***Rehabilitation of Fisheries-based livelihoods***

- Damages to craft, gear and livelihoods, based on governments and other data
- Interventions so far in the pre-harvest, harvest and post-harvest sector
- Nature of interventions that have been specifically aimed at women and at other vulnerable groups in the fisheries.
- Key issues arising (example, oversupply of boats, inappropriate or poor quality of boats and equipment supplied, boats/ equipment supplied to non-cohesive groups leading to conflict/ cornering of benefits by influential individuals)
- Potential impact of interventions on vulnerable groups (especially women) and on the sector as a whole (example: cold chain technologies and impact on women, supply of new trawlers/ destructive gear and impact on small-scale…)
- Some examples/ case studies of best practices (example: technologies for post-harvest specifically targeting women, process used for deciding on and implementing rehab etc.)

This section should draw on both secondary and primary sources (government, NGOs, fishing communities, boat yards, net and motor suppliers, and suppliers of other equipment). It could also draw in issues related to damage to aquaculture farms and facilities and efforts towards restoring them, to the extent that this is relevant to the fisheries sector and fishing communities.

***Rehabilitation of fishing communities: Land and shelter issues***

- Number of fishing villages affected based on government and other records

- Extent to which villages that have been reconstructed `in situ', or have been relocated. Whether decision to relocate was taken in participatory ways, and whether land is considered suitable

- Housing: whether participatory processes/ scientific norms are being followed

- Key issues in reconstruction and rehabilitation of fishing communities

- Some examples/ case studies of best practices (example: participatory processes, use of sound technical inputs in making housing decisions etc.)

This section should draw on both secondary and primary sources (government, NGOs, fishing communities)

***Institutional aspects***

- The role played by traditional institutions within fishing communities in response to the tsunami disaster, and in particular, the way they are mediating relief and rehabilitation efforts;
- A critical analysis of the roles and functions of traditional institutions, and the potential role that they can play in fisheries and coastal resource management post-tsunami.
- A general overview of the respective role being played by government, civil society actors, UN agencies etc. in rehabilitation

## Annex 2: List of Resource Persons

| Name | Organisation | Issues discussed | Place |
|---|---|---|---|
| | | | |
| Peter Flewwelling | FAO, Chief Technical Officer Fisheries | damage, interventions general & FAO | Banda Aceh (BA) |
| Mulia Nurhasan | FAO, Consultant Fish Processing | support prog Fish processing | BA |
| Antoine Munoz | Red Cross Belgium, head Rehabilitation Marine | bigger vessels & cooperatives | BA |
| Marcel de Brune | IRC, Deputy Director Programme | Fisheries programme Calang region | BA |
| Jon Cook | ADB, consultant Fisheries | Future Fisheries programme ADB | BA |
| Iskandar Ahmad | DKP NAD, head prov Fisheries Dep | Fisheries policy, damage and support | BA |
| Sjafi'i | kabit DPK, district head fisheries dep | overview damage and interventions | Calang |
| Yusya | BRR, vice-deputy Fisheries sector | BRR's role in coordinating support, gaps and best practices | BA |
| Icut | Walhi, director | fisheries ngo network, PLL | BA |
| Zulhanuddin, Hsb | Pugar, exc director | fisheries programme, PLL | BA |
| Budi A | YKMA, director local ngo on adat | Panglima laot institution, history, strength, info mukims pulau Brit Utara and Labuhan Taro, close to Meulaboh | BA |
| Farida | Paska, director | Livelihood programmes fisheries | Sigli, Pidie |
| Suhaimi | Permata, regional coord. | Livelihood act fisheries | Bireuen |
| Muna | Permata, director | programme act. | BA |
| Eva Erdalina | Yasindo, coord livelyhood progr | fisheries activities | Ulee Glee, |
| Mansur M. Kiran | Yasindo director | | Jangka Buaya |
| Miska Zulyadi | PAPAN, director | programme act, policies | Meulaboh (Mereubo, Nagan Raya) |

| Name | Organisation | Issues discussed | Place |
|---|---|---|---|
| T. Irwansyah | YPK, director | fisheries act and | Meulaboh (Samatiga) |
| Faisal Fahmi | YPK, staf (ex fisherman) | group management policies | |
| Adli Abdullah | Panglima Laot (PLL),secretary province NAD | PLL role and activities | BA |
| T. Muttaqin ('DekPon') | PLL, staf province office | data | BA |
| Pardan | PLL secretary district level Pidie YLEPP, director | damage and interventions | Sigli |
| T. Risman | PLL secretary district level Meulaboh and boardmember fisher cooperative | co-operative management of vessels | Meulaboh |
| Sarbini Yamin | PPL Lhok Ujung Muloh | local fisheries sector | Lamno |
| Indriansah | PLL Lhok Ulee Lheue | localfisheries | BA |
| Zulkifli | PLL secretary local level Lambada | local fisheries | BA |
| Hj Nazar | PLL local level Kula Panta Raja, Pidie | | Kuala Panta Raja |
| Munir | PLL Lhok Jangka Buaya, Pidie | local fisheries | Jangka Buaya, Pidie |
| Halidin | PLL Lhok Kula Tadu, Meulaboh | local fisheries,coop management | Kuala Tadu, Nagan Raya |
| Ibu Anca, Ibu Yus | Local fish processors/ traders | support and trade practices | Jangka Buaya , Pidie |
| M.Isa | Fisher Lancang, Samalanga Bireuen | local fisheries and help | Lancang, bir |
| Basri Bintang | Tauke, dried fish trader | local market and fish processing | Curee Tunong, |
| Ibnu Hajar | Head Putra Pantai fishers group (Permata) | group ownership and management | Curee Tunong, |
| Ibu Numra, pak Zulkifli | Tauke, dried fish proc and traders (Yasindo) | received help and practices | Jangka buaya |
| Umar Usman | Fisher, head of pukat pantai team | received help Yasindo | Jangka Buaya |
| Mariani A. Rahman | Fish processor/ trader | complaining no help | K Panta Raja |
| Wardiah Asan | Fish processor/ trader | | |
| Sadiah Hasan | Fish processor/ trader | | |
| Hj Sauda Masyam | Head fish traders group | help distribution and trade | |

| Name | Organisation | Issues discussed | Place |
|---|---|---|---|
| Darmawati (Dedek) | Fish processor/ trader | | |
| Safriada | Member fishers coop Ikan Jeuneuha | set-up coop, help PLL Abdullah Hadiz | Pasi Lhok, Kembang Tanjung |
| Farida | Fish processor/ trader | business support via local ngo CDI | Pasi Jumeurang,KembangTanjung, Pidie |
| Abdullah Azis | Boatmaker | boat building and management | Kuala Tadu, Nagan raya |
| Muge-muge' | Fish traders cum vendors | trading activities andsupport | Kuala Tadu, nagan raya |
| T. Zulbaili | LEM Lhok Bubon, manager fish trader | village asset management and coord | Lhok Bubon, Samatiga, Meulaboh |
| Musliadi | LEM Pucok Lueng, manager tokoh masyarakat | idem | Pucok Lueng,Samatiga |
| Mustafa Kamal | LEM Pucok Lueng, head of fisheries sector | idem | Pucok Lueng, Samatiga |
| Umran Jori | Boatmaker | boat training FAO | Lhok Bubon,Samatiga |
| Tarmizi | Boat cleaner | work opportunities Panggong, port | Meulaboh |
| M. Amin Hakim | Fisher and trader, tauke 'ngek beng' | local fisheries situation Calang | Calang |
| Suwardi and Muliadi | fishers Lamno | boat preference and support | Ujung Muloh |
| Riza udin | Fisher Lamno | work | Janguet |
| Marzuki Hz | Fisher Lamno | local fisheries and support | Ujung.Muloh |
| Herman | Fisher Meulaboh | work and live Panggong | Meulaboh |

## Annex 3: List of Key Documents

Aceh – Rehabilitation and Reconstruction website: www.e-aceh-nias.org

Bappenas – Master Plan for the Rehabilitation and Reconstruction of Nanggroe Aceh Darussalam Province (NAD) and Nias islands, North Sumatra (March, 2005)

BRR and International Partners - Aceh and Nias one year after the tsunami: The Recovery Effort and Way Forward (December 2005)
BRR website: www.brr.or.id

DKP - Rehabilitatisi dan Rekonstruksi Provinsi Nanggroe Aceh Darussalam Paska Bencana Alam Tsunami sektor Kelautan dan Perikanan (2005)
- Rehabilitatisi dan Rekonstruksi Provinsi Nanggroe Aceh Darussalam dan Sumatera Utara Paska Bencana Alam Tsunami sektor Kelautan dan Perikanan Tahun 2005

FAO –Consultant Mission Report
- An assessment of the impact of the 26th December 2004 earthquake and tsunami on aquaculture in the Provinces of Aceh and North Sumatra, Indonesia (March 2005), by Micheal Phillips and Angus Budhiman
- National Consultant (Fisheries) Tsunami affected in Aceh (January 2005), by Akmal Syukri
- Assessment of the fisheries sub-sector after the earthquake of 28th March 2005 in Nias and South Nias Districts (June 2005), by Jean Gallene
- Emergency Needs Assessment Mission (April 2005), by Jean Michel Le Ry
-Post Tsunami assessment of boatbuilding activities in Nanggroe Aceh Darussalam (NAD), Indonesia (March 2005), by Mike Shawyer
- Rehabilitation and Reconstruction of the fishing ports and fish-landing sites in Aceh after the Tsunami (March 2005), by Sigurdur Sigurdurson
- Emergency assistance to support the rehabilitation in tsunami affected areas in Indonesia, Nias Island and N. Sumatra Province (March 2005), by Jean Gallene
- Post tsunami Emergency Intervention and Rehabilitation of Fisheries in Nanggroe Aceh Darussalam (NAD) Indonesia (March 2005), by David James

FAO website: www.fao .org
FAO website report index: http://www.fao.org/tsunami/fisheries/index.htm

The Asia Foundation: Aceh Rehabilitation and Reconstruction Appraisal, ARRA (2005)

## Annex 4: Detailed Table Fishing Boats in Aceh pre-tsunami

Breakdown of Boats by Propulsion type by District before Tsunami

| Nr | District | Non motorised | | Outboard engine | | Inboard engine | | Total | |
|---|---|---|---|---|---|---|---|---|---|
| | | mmaf | fao | mmaf | fao | mmaf | fao | Mmaf | Fao |
| 1 | Banda Aceh | 35 | 50 | 80 | 92 | 114 | 268 | 229 | 410 |
| 2 | Aceh Besar | 218 | 790 | 475 | 492 | 202 | 341 | 895 | 1623 |
| 3 | Pidie | 647 | 838 | 280 | 731 | 355 | 478 | 1282 | 2047 |
| 4 | Bireuen | 845 | 855 | 614 | 614 | 574 | 727 | 2033 | 2196 |
| 5 | Aceh Utara | 236 | 381 | 392 | 460 | 816 | 911 | 1444 | 1752 |
| 6 | Lhokseumawe | - | 252 | - | 417 | - | 171 | - | 840 |
| 7 | Aceh Timur | 317 | 415 | 109 | 11 | 1364 | 1560 | 1790 | 1986 |
| 8 | Langsa | - | - | - | - | - | 427 | - | 427 |
| 9 | Aceh Tamiang | 302 | 191 | 326 | 135 | 628 | 930 | 1256 | 1256 |
| 10 | Sabang | 135 | 135 | 80 | 203 | 146 | 144 | 361 | 482 |
| | Total East Coast | 2735 | 3907 | 2356 | 3155 | 4199 | 5957 | 9290 | 13019 |
| | | | | | | | | | |
| 11 | Aceh Jaya | - | 225 | - | 299 | - | 257 | - | 781 |
| 12 | Aceh Barat | 645 | 193 | 198 | 24 | 817 | 515 | 1714 | 732 |
| 13 | Nagan Raya | - | 260 | - | 136 | - | 197 | - | 593 |
| 14 | Aceh Barat Daya | 568 | 653 | 163 | 140 | 140 | 172 | 871 | 965 |
| 15 | Aceh Selatan | 1265 | 1265 | 626 | 626 | 474 | 483 | 2365 | 2374 |
| 16 | Aceh Singkil | 405 | 405 | 112 | 112 | 597 | 579 | 1114 | 1096 |
| 17 | Simeulue | 640 | 2088 | 430 | - | 7 | 1706 | 1077 | 3794 |
| | Total West Coast | 3523 | 5089 | 1529 | 1337 | 2089 | 3909 | 7141 | 10335 |
| | | | | | | | | | |
| | Total | 6258 | 8996 | 3885 | 4492 | 6288 | 9866 | 16431 | 23354 |

Source: MMAF 2003 and FAO as noted in assessment by Akmal Syukri 2005

Type and Number of Fishing Gear on East and West Coast before Tsunami

| Region | Quantity Net | | | | | Hand line | Traps |
|---|---|---|---|---|---|---|---|
| | Shrimp net | Purse seine | Ktg | Gillnet | Liftnet | | |
| East Coast | 318 | 1416 | 977 | 4303 | 474 | 2576 | 735 |
| West Coast | -- | 384 | 656 | 4191 | 459 | 7373 | 1116 |
| Total | 318 | 1800 | 1633 | 8494 | 933 | 9949 | 1851 |

Source: MMAF 2003

## Annex 5: Detailed Table Boats Lost and Damaged in Aceh

Number of Boats Lost and Damaged by Propulsion type by District

| Nr | District | Non motorised | | Outboard Engine | | Inboard Engine | | Total Boats | |
|---|---|---|---|---|---|---|---|---|---|
| | | Lost (%) | dam | Lost (%) | dam | Lost (%) | dam | Lost (%) | Dam |
| 1 | Banda Aceh | 43 (86) | 7 | 81 (88) | 7 | 145 (54) | 35 | 269 (66) | 49 |
| 2 | Aceh Besar | 690 (87) | 2 | 293 (60) | 32 | 295 (87) | 18 | 1278 (79) | 52 |
| 3 | Pidie | 495 (59) | - | 419 (57) | 229 | 78 (16) | 100 | 992 (48) | 329 |
| 4 | Bireuen | 378 (44) | - | 238 (39) | 136 | 476 (66) | 175 | 1092 (50) | 311 |
| 5 | Aceh Utara | 177 (46) | - | 187 (41) | 96 | 321 (35) | 171 | 685 (39) | 267 |
| 6 | Lhokseumawe | 227 (90) | 5 | 380 (91) | 11 | 152 (89) | 8 | 759 (90) | 24 |
| 7 | Aceh Timor | - | - | - | - | - | 567 | - | 567 |
| 8 | Langsa | - | - | - | - | 2 (1) | - | 2 (0) | |
| 9 | Aceh Tamiang | - | - | - | - | 12 (1) | 21 | 12 (0) | 21 |
| 10 | Sabang | 100 (74) | - | 176 (87) | 7 | 28 (19) | 45 | 304 (71) | 52 |
| | Total East Coast | 2110 (54) | 14 | 1774 (56) | 518 | 1509 (25) | 1140 | 5393 (41) | 1672 |
| | | | | | | | | | |
| 11 | Aceh Jaya | 215 (95) | - | 256 (86) | - | 84 (33) | - | 671 (86) | - |
| 12 | Aceh Barat | 82 (42) | - | 2 (8) | - | 236 (46) | 217 | 445 (61) | 217 |
| 13 | Nagan Raya | 230 88) | - | 124 (91) | - | 156 (79) | - | 510 (86) | - |
| 14 | Aceh Barat Daya | 14 (2) | - | 9 (6) | - | 79 (46) | 15 | 93 (10) | 15 |
| 15 | Aceh Selatan | 98 (8) | 12 | 38 (6) | 51 | 117 (24) | 85 | 261 (11) | 148 |
| 16 | Aceh Singkil | - | - | - | - | - | - | - | - |
| 17 | Simeulue | 255 (12) | 148 | - | - | 230 (14) | 213 | 485 (13) | 361 |
| | Total West Coast | 894 (18) | 160 | 429 (32) | 51 | 902 (23) | 530 | 2464 (24) | 741 |
| | Total | 3004 (33) | 174 | 2203 (49) | 569 | 2411 (24) | 1670 | 7858 (34) | 2413 |

Source: FAO Assessment by Akmal Syukri, 2005