

REPORT

**UNDP / World Bank / FAO
Joint Tsunami Disaster Assessment Mission**

4 - 8 January 2005

Livelihood Recovery & Environmental Rehabilitation



Thailand

10 January 2005

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Area Map and main sites visited



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Objective of the mission:

To assess the mid- to long-term impact of the tsunami disaster and identify possible areas of partnerships between Government agencies, local NGOs, the World Bank, and UN agencies in two priority areas:

- (i) Sustainable recovery of livelihoods among the local population in general;
- (ii) Recovery of fisheries, in particular;
- (iii) Environment rehabilitation, sustainable coastal zone planning, and eco-tourism.

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SECTION I: AN OVERVIEW OF LIVELIHOODS

About 490 fishing villages along the Andaman coast and islands were affected by the Tsunami that struck on 26 December 2004. The impact on these villages ranges from some broken fishing equipment on the beach to complete and utter devastation with great loss of life. The worst affected village, Ban Nam Khem lost about half of its population of 6,000, nearly 80% of its infrastructure, and most fishing boats and equipment.

In total it is estimated that 3,402 small fishing boats and nearly 1,127 large fishing trawlers were destroyed or seriously damaged by the tsunami in Thailand. More than 459 rais of fish/shrimp farms and more than 7,000 fish/shrimp ponds were damaged. It is estimated that the livelihood of 100,000 – 120,000 people have been affected. The rough estimate of total loss in the fishing industry is currently around 500 million baht.

The destruction caused by the Tsunami appears to be very much localized and varies from total to almost invisible destruction. The common characteristics that played a major role in the impact of the Tsunami on all worst hit locations are:

- Very crowded human settlements at immediate proximity of the shoreline (tourism related facilities and fisher folks communities) that experienced in recent years a booming and poorly planned development
- Very low elevations (flat lands) of these settlements (a couple of meters above sea level) in exposed wide bays (to the west and south west) with no coral reef barriers and with sea beds presenting steep slopes and no natural barriers such as islands that could provide natural protection
- A total un-preparedness for such event with no historic records of similar disasters (including typhoon and hurricanes sea surges) nor warning systems or structures to mitigate potential damages caused by natural disasters whatever their causes may be.

“All eggs in one basket”

The worst hit area, the central Thai Andaman coast from Phan Nga to Krabi with Phuket at the centre has seen a recent booming development of economic activities based on the coast and that are little diversified and all interwoven. They all rely on an increasingly depredated and fragile environment and are pulled by the major driving force of the rapid and expanding development of mass tourism.

In the past, the rural and coastal communities of Phan Nga and Phuket for example used to rely more on mostly land based activities such as forestry products, commercial agriculture (fruit orchards, copra, rubber) and tin mining. Fishing and aquaculture, although present, represented somewhat very marginal activities some 30 years ago.

Directly and indirectly, the booming of the tourism industry generously promoted and supported provided new attractive sources of income and jobs for the local younger generations (up to 50% of the staff employed by the destroyed major complexes of Khao Lak was from the surrounding communities) in once laid back communities. The tourism industry also provided new markets for the local production and subsequent revenues were invested in services and small businesses mostly oriented towards the industry (small souvenir shops,

restaurants, guided tours) all located along the coast in the vicinity of large resort complexes that are for some completely obliterated today.

All along the central portion of the coast, the fishing communities which are traditionally among the poorest in Thailand saw the opportunity and directed a significant part of their activity to supply restaurants and resorts in fresh highly prized reef fish species and sea food products in general, increasing further the over exploitation of marine resources including in protected areas and expanding in size. There was also a handy opportunity to provide sea transportation services for tourist to nearby beaches and island. Migrant workers from Burma became the even more predominant labour force in the fishing industry while young Thai nationals from fishing communities rather targeted the more profitable tourism related jobs.

Some sea gypsies' communities became sedentary in Phuket partly (but not only) due to the attraction of revenues from the tourism industry. Apart from being in themselves a (debatable) tourist attraction, they provide cheap labour (often the cheapest next to Burmese migrant workers). They also use their boats for sea transportation of tourists to the islands of the bay of Chalong and Rawai. On the other hand some other sea Gypsies communities (moving along the Andaman coast) still have more or less their original livelihoods strategies mostly based on fishing and harvesting seashells. The latter proved to be quite resilient and there are accounts of communities that literally escaped the Tsunami thanks to indigenous knowledge. It is important to consider these differences and even take into account and utilise indigenous knowledge when appropriate in the recovery phase.

In summary, the flourishing and fast development of the coastal areas of Phuket, Phan Nga and Krabi provinces consisted poles of attraction for people originating from all over the kingdom and even abroad. This has contributed to “artificially” increase the population having their livelihoods almost entirely oriented, directly or indirectly towards the exploitation of coastal natural capital and resources.

The tight interdependency of livelihoods on a limited range of opportunities, all linked to the coastal environment and sustaining a large mixed population constitutes the major source of vulnerability for the post Tsunami recovery.

Sample of foreseeable impacts of the Tsunami on Livelihoods

- There is no doubt that the Tsunami will cause a large loss of income from tourism, fishing and all related activities. People have not only lost their productive assets such as boats, fishing equipment and business facilities (hotels, shops, rental equipment) but the expected tremendous drop in the demand in the mid-short term will take time and huge efforts to recover previous levels. Although the government has taken quick steps to respond to these losses in the short term, one has to expect long-term effects as well. There is therefore a crucial need for long-term mitigation measures in the management and planning for more resilient livelihoods.
- The fact that many livelihoods strategies in these coastal areas are tightly linked to the tourism industry is a double-edged sword. The loss of income from tourism alone is estimated at 10 billions Bath per month. Adding the loss of life, property and confidence, and compounded effects on depending livelihoods, this can contribute to a general impoverishment of the coastal communities if adequate support is not provided (local

sources estimate that as much as between 4000 and 4500 families have lost literally everything in Phan Nga coastal districts alone).

- It is highly expected that the Government and TAT will make a huge effort in terms of compensations but how the industry will pick up again, and in its wake the other subsequent livelihoods will pretty much depend on the reaction of the foreign and national demand for “Thai Andaman coast” tourism products.
- The impact on the fishery sector alone is a huge area for concern as explained in detail further. (See section II) It is very important that this sector gets appropriate attention.
- The limited but certain impact on marine and coastal natural resources that constitute the base of the economic activities in the area will further hamper the immediate livelihood strategies.
- Highly justified and desirable measures to prevent further environment degradation (new zoning of natural parks, closure of specific sites) are likely to shut down opportunities that although somewhat “illegal” were sources of income for indigenous communities. Appropriate replacement opportunities or alternatives will have to be found in parallel.
- Similarly, the disaster has pointed out the limitations or mishandling of rules and regulations such as land ownership/access issues, predation on protected environment, insurance, labour enrolment rules among others. Though highly desirable, new rules and stricter enforcement may decrease the level of entrepreneurship that was once exploiting gaps and local “laissez faire” and driving the “flourishing” local economy.
- Migrant workers (temporary or semi permanent) of Thai or foreign origin are likely to move back (willingly or not) to their communities of origin. It is not evident how and when that cheap migrant labour force that once provided a competitive advantage for some local business will return or be allowed to do so in a near future. According to local sources, there is a problem with an estimated population of at least 10 000 of “Thai Plad Thin” (stateless) in Ranong province. Socially and rights based measures will have to be found and implemented.
- The pre-Tsunami most vulnerable groups (poor fisher folk’s communities, single headed households, illegal migrant workers, and others...) who were already depending on fragile and marginal livelihoods and enjoying a sub-standard status in the society are likely to be even more weakened and further precipitated into poverty if specific and well suited support is not provided to them.
- Disasters of this magnitude are known to increase vulnerability to the spread of HIV/AIDS and other sexually transmitted diseases.

General Recommendations on livelihood (sample)

- There is a short-term need for alternative livelihoods mechanisms while the main driving economic sectors (tourism and fishing) are being re-equipped, adapted and improved

(particularly in terms of planning). Coping and self-help mechanism set in place by the communities should be identified and promoted.

- Immediate and mid term response should be tailor made for broad categories of situations such as highly impacted, intermediate and low impacted. (see also more specific issues in Section II and Annex 5).
- A special attention should be given to economically fragile communities such as vulnerable households (e.g the one who lost one or more active members, migrant workers if still present, small fishing crews...). Consensus between local communities, authorities and implementing agencies should be sought in selecting the most vulnerable.
- Communities should be encouraged to integrate disaster mitigation mechanisms from the scratch while reconstructing their livelihoods. In that regards, incentives and support to diversify the livelihoods strategies and develop potentially new economic resources and partnerships outside the strictly marine or coastal environment should be given priority.
- Given the socially destructive dimension of the Tsunami, there is an opportunity and a necessity to mainstream HIV/AIDS awareness and prevention in the recovery process.
- The Tsunami provides an opportunity for a more balanced and planned economic development approach. Planning and education for disaster mitigation is almost a precondition to restore the tarnished image of the affected areas and to restore confidence between authorities, local populations and Clients abroad.
- Confidence-building mechanisms should be implemented immediately. Communities should be educated on what happened and on how to address their inherent vulnerability to such disaster even if the probability that a Tsunami strikes again the same area is very low. Even if there are plans for high tech regional warning systems, local knowledge is the best aid to long-term protection.

SECTION II: FISHERIES

The total fish production for all of Thailand (both Andaman Sea and Gulf of Thailand) in the year 2000 was estimated by DOF as 3.7 million mt. The total fishery involved some 826,980 fishers using approximately 17,295 DOF registered fishing apparatus from 53,538 Department of Harbours registered fishing vessels¹.

The marine catch was valued at some 49.40 billion baht or just over US\$1.1 billion in 2000 and accounts for some 2.77 million mt, or 79% of total fisheries production². Catch usage falls into the following categories: a) 52% food fish, b) 31% trash fish, and c) 17% squid and cuttlefish, shrimp, shellfish and others. It is reported (FAO Thailand Country Profile Web Page) that 31.7% of the total marine catch is taken in the Andaman Sea.

FAO information in the Andaman sea fishery of Thailand³

FISHERY	LICENSED FISHING GEAR ⁴ 2000	FISHERS 2000	CATCH & VALUE 2000 (000s of mt & US\$ Millions Equiv Yr 2000)	CATCH & VALUE 1996 (000s of mt & US\$ Millions Equiv Yr 2000)
COMMERCIAL				
Trawl	1,017	9,143	490 mt / \$199.542	512 mt / \$250.925
Purse Seine	415	9,971	184 mt / \$58.713	291 mt / \$86.941
Gillnet & Entangle Net	57	436	1 mt / \$1.729	3 mt / \$2.489
Sub-Total	1,489	19,550	675 mt / \$259.984	806 mt / \$340.355
ARTISANAL				
Small gill net	194	388	28.439 mt / \$43.377	12.615 mt / \$21.903
Trap	10	20	4.662 mt / \$7.871	3.439 mt / \$5.098
Hook and Line	10	10	1.091 mt / \$1,355	2.040 mt / \$1.414
Sub-Total	214	418	34.192 mt / \$52.603	18.094 mt / \$28.415
TOTAL	1,703	19,968	34.867 mt / \$312.587	18.900 mt / \$368.770

Fisheries impacts and current response (5)

The priority of villagers in worst affected villages is the retrieval of their dead, however, even in the worst impacted villages there is also a need for households to get back to their livelihoods. This is probably a natural reaction to disaster and probably an important part of the 'getting back to normal' process. For fisher folk, this means getting back on the water, although some have expressed the feeling that the unpredictable nature of the disaster has left them cautious and anxious about whether it will reoccur.

¹ Note that Department of Harbours licenses vessels (53,538 licensed as fishing vessels) while DOF licenses fishing gear (17,295 licensed in 2000).

² FAO Web Page, *Thailand Country Profile* (www.fao.org/fi/fcp/en/THA/profile.htm)

³ Statistics provided courtesy of the Department of Fisheries, Thailand via the FAO Questionnaire 2003.

⁴ Note the fact that DOF licenses fishing gear (17,295 in 2002), and DOH registers fishing vessels (54,538 2000) – the discrepancy between the two figures being significant. DOF figures are utilized as this is the only available recorded catch information.

⁵ For further information and updates on the tsunami and fisheries impacts see:

<http://www.apfic.org/> Asia Pacific Fishery Commission

<http://www.fao.org/tsunami/> FAO Tsunami website

<http://www.enaca.org> Network of Aquaculture Centres in Asia

<http://www.icsf.net> International collective in Support of Fish workers

<http://www.bobpigo.org/> Bay of Bengal inter-governmental Organization

Ranong is one of the most under populated provinces, where over half of the labour force are from Myanmar. Other provinces such as Phangna also have significant numbers of migrant labourers from Myanmar. Many of these are employed in the fishery sector in: shrimp farms, shrimp hatcheries and larger fishing vessels.

Department of Fisheries response to the tsunami impacts

The Thai Department of Fisheries has established a “Fisheries Rescue Centre” in Phuket (based at the Andaman sea fisheries research and Development Centre⁶. The centre is coordinating the collection of damage and loss information for the Department of fisheries from all five affected provinces. As the losses are registered with the Provincial fisheries offices, these are communicated twice daily to the Fisheries Rescue Centre (FRC).

Data collected is restricted primarily to the cases of lost or damaged fishery equipment (boats) and losses incurred in aquaculture holdings. The detailed information is listed by village and it is therefore possible to identify at sub-district (Tambon) and even village level (in some cases) where significant losses have been reported. This data set can therefore be used as an indicator to assist in identification of the most affected areas.

The loss information collated by DOF is not linked to other data at the national level – but this might be possible to undertake at the provincial level. There may be some need for support to the Provincial office responsible for this in the short term.

Whilst some information is related to claims of losses, the Provincial fisheries office is also collecting some village level information relating to losses.

⁶ Address: 77 Sakdidej Rd., Amphur Muang, Phuket, 83000, Tel: +66-0-7639-1138 to 40 FAX +66-7-639-1139 afdec@yahoo.com

Districts and number of villages registering fisheries/aquaculture losses or damage

There are 74 affected sub-districts and a total of 386 villages that have reported losses for fisheries and/or aquaculture.

	Areas of losses	
	Sub-district	Village
Ranong	7	22
Meuang	2	11
Kapoe	2	7
Branch Dist. Suk Samran	3	4
Phangna	15	73
Takua Pa	4	11
Takua Tung	2	13
Tai Meuang	2	7
Koh Yao	2	14
Kuraburi	4	23
Meuang	1	5
Phuket	8	81
Meuang	6	42
Krathu	2	11
Tha Lang		28
Krabi	23	123
Meuang	6	34
Klong Thom	5	19
Neua Klong	4	18
Ao Leuk	3	16
Koh Lanta	5	36
Trang	12	51
Gantang	4	14
SikAo	3	12
Palien	3	13
Branch Dist. Haad Samran	2	12
Satun	9	36
Meuang	5	15
La Ngu	4	21
Thung Wah	3	10
Total	74	386

Targeting of impacted villages and households

DOF reported losses can be ranked according to the number of claims and this can be disaggregated to village level for most provinces (Satun, Trang, Krabi, Phang Nga, Phuket but not Ranong).

The large number of claims indicates serious impacts to fisheries or aquaculture livelihoods and is spread through all five affected provinces. If this information is coupled to village level information regarding loss of life and damage to housing (and any other available indicators) it will enable the ranking of villages into those that have been severely impacted and those where the impacts have been less severe or even minor (it is important to note here that this would not probably be a good targeting method for villages and households heavily dependent upon tourist services, since the tourist locations are focal, but those servicing the tourist sector may come from a wider area).

Villages severely affected could be focused on for a comprehensive package of interventions relating to livelihoods rehabilitation and community organization type activities. The interventions in these areas would require both short-term mitigation response as well as longer term rehabilitation.

Less affected villages (i.e. those which have incurred losses to fishing/aquaculture equipment but relatively limited impact on other structures and/or loss of life, could be grouped for more immediate assistance but that does not require intensive holistic type intervention.

Villages with very limited impact on equipment/fishing vessels/aquaculture facilities may be given low priority, but should still be subject to some form of cross-check or verification type activity, to ensure that there are not other deeper livelihood related issues that are not linked to the indicators used for the preliminary screening (i.e. villages with a high dependence on servicing the tourism sector).

It is clear that many larger scale operations may not have reported losses because they do not require compensation (i.e. the amount offered is quite limited relative to their losses and therefore not worth the administrative paperwork to make the claim).

Compensation system and rates

There is an established system for registering losses following a natural disaster (e.g. cyclones, floods and most recently tsunami). Losses or damage claims that may be eligible for government compensation are registered at the Provincial fishery office (and possibly at Amphur level if a fishery officer is present).

Boat owners (as listed on boat registration) must register the loss with the Registering district or province within 15 days in the area where the vessel was affected or the registered home place of the vessel owner. The Provincial fisheries office (or district fisheries office) must collate the documents and check for accuracy before sending to the Department of Fisheries within 120 days.

Typical documentary evidence required for compensation is the vessel registration document, or permission to fish document (in date). Since the majority of vessels that have been damaged or lost are in the small-scale category, very few actually have registration documents. In this case alternative evidence of ownership may be considered/used as supporting evidence:

Statement of ownership by the Provincial fisheries Office (stating the boat is repairable or beyond repair)

Document of guarantee from a fishers association, farmers group, or fishery cooperative stating the owner is a member, or

Sub-district headman (gamnan)

Guarantee document from the village headman) may be accepted

Record in the fishery survey,

a) Compensation for fishing vessels

There are several categories of loss that are eligible for compensation:

- i) Support for the recovery of a vessel (i.e. refloatation, or movement of the vessel – since many have been swept some distance inland above the high tide mark).
- ii) Support for repairs to a damaged vessel
- iii) Compensation for vessel loss (or damaged beyond repair)

The levels of compensation have been announced recently (but it is uncertain whether these will be revised as further information emerges). Current rates are as follows:

Fishing vessel less than 10 metres length	Baht
Retrieval	10,000
Repair	20,000
Vessel lost	66,000
Fishing vessel less than 10 metres length	
Retrieval	25,000
Repair	70,000
Vessel lost	200,000

b) Compensation for fishing gear loss

Loss of fishing gear may be compensated (at a relatively low rate (about 3,000 baht per case). This is extremely difficult to assess unless the gear is assumed to have been associated with the vessel. In this was the vessel and the gear operated are assumed to be lost together. Small-scale artisanal gears may be reconstructed (such as fish and crab traps). Larger gears such as nets will require purchase.

The tsunami wave destroyed a significant amount of fixed gears, (such as bamboo stake traps ‘pong pang’) that are actually illegal. There is an opportunity at this stage to limit the re-establishment of illegal fixed gears. However, in cases where fishers have lost boats, they may start to use lower cost gears (which may be illegal) that do not require a boat as a coping strategy. This should be taken into account.

c) Compensation for aquaculture holdings

Information regarding loss from aquaculture holdings does not appear to have been announced (verify), however the document made available to the mission, that contains the dates of compensation also includes rates for aquaculture. Compensation is payable in the case of:

Loss of fish stocks 1,400 baht per rai (for a total area not exceeding 5 rai)

Loss of shrimp and crabs 3,800 baht per rai (for a total area not exceeding 5 rai)

Cases of culture of fish in a cage, cement tanks or other (e.g. aquarium fish, frogs, soft-shelled turtle,) compensated at 150 baht per square metre of production upto an area not exceeding 80 square metres.

Reported fishing vessel losses by Province (detailed list in annex)

Vessels that have been reported lost or damaged are 1,127 large vessels (over 10 metres length) and 3,402 vessels (below 10 metres length). A crude approximation can be made in the case of the small fishing vessels that there is one vessel per family (i.e. approximately 3,402 small-scale fishing households have been affected).

For larger vessels the same approximation may not necessarily be applied as owners may have more than one vessel, although there are long tail boats that have a length of 10 to 12 metres. In several of the large harbours larger trawlers were damaged as there were many vessels in port at the time the tsunami struck.

A total of 597 vessels have been reported as retrieved either by the DOF or the by the owners themselves.

The costs of damage to vessels are variable and have not yet been estimated. This is because the actual compensation will depend upon the extent of the damage that has yet to be determined.

Province	Areas of losses		Total Registered vessels		Vessels damaged/lost		Vessels retrieved		
			>10 m.	<10 m.	>10 m.	<10 m.	>10 m.	<10 m.	
	Sub-district	Village	Large	Small	Large	Small	Large	Small	
Ranong	7	22	587		1,408	191	297	13	27
Phangna	15	73		825	2,782	284	607	107	153
Phuket	8	81	574	676		476	636	157	41
Krabi	23	123	312	2669		147	775	1	44
Trang	12	51	626	2365		0	594	0	0
Satun	9	36	783	2172		29	493	5	49
Total	74	386	3,707	12,072		1,127	3,402	283	314

There is an important distinction between damage to vessels and actual loss (i.e. irreparable damage that requires replacement). In the case of replacement of the vessel, there may be issues of availability of vessels - the original wood that the vessels were constructed from may not be readily available and reconstruction of the original type of vessel may not be possible (or at least not quickly). Replacement with a fibreglass composite structure may not be useful or encounter some resistance from (if the design is not appropriate and due to the lightness of the vessels). Engines that power this design are typically diesel long tail engines these may be more favoured in place of 'modern' outboard engine (which run on petrol and may not be as robust or flexible as the original). There is a fibreglass version of the long tail boat that has been commissioned by an NGO working in Krabi province.

Tourist vessels (typically long tail fishing boats used for tourist purposes)

In the table above, numbers of vessels reported as lost or damaged for Phuket include 87 large tourist vessels and 76 small tourist vessels (converted fishing boats). These can be separated from actual fishing vessel losses. For other provinces all vessels reported are for fishery purposes.

A separate list of tourism vessels is given in Annex 2 (typically small fishing boats that are used on day trips, carrying tourists to islands). The majority of these reported damaged or lost are in Krabi province (342 out of a total of 363). The total estimated damage (363 vessels) is 34 million Baht (average 94,000 baht per vessel – these are typically long tail boats).

A critical aspect of the tsunami impact in Thailand is the extent to which fisher folk have left the fishery or reduced their dependence upon it, in favour of providing boat services to tourists. The tsunami has therefore had a double blow - in damaging the vessels that they would use for their livelihood as well as driving tourists away from these areas. Replacement or repair of these tourist vessels will not in the short term ensure that there are enough tourists to provide an income for these people. It might be expected therefore that a short term coping strategy will be to return to fishing, even though the income from this activity is far lower than that which is normally obtained from tourism.

An additional aspect of this is that families may be dependent upon tourism employment in a broader way such as servicing local hotels and the mobility of family members means that

the impact will be felt over a wider area than that immediately damaged by the tsunami (e.g. women's employment in hotels).

Impact to fisheries infrastructure (e.g. harbours and jetty services)

A number of fishing harbours have incurred damage (the most significant being Ban Nam Kem). Reports are variable but it seems that there are : Ranong 8, Phangna 2 (or more) (Ban Nam Kem, Thap Lamu), Satun (Pak Bara) [this list is not complete].

Damage or losses of jetty services have not been reported as yet (e.g. fuel operations, ice-making and cold storage structures that are typically found at fish landing sites). Yet such land-based infrastructure will have been affected (in Ban Nam Kem – all services were completely destroyed, but this is an extreme example). Some of these facilities would be state owned or operated or possibly through cooperative type ventures. Many ventures would also be privately owned by entrepreneurs (i.e. not directly involved in fishery production).

An assessment would have to at last get a breakdown of the number of harbour sites that were directly impacted by the wave. There has been a great deal of minor damage in areas not in the actual path of the wave and this can be readily rectified and should not be a focus of intensive rehabilitation.

Harbour locations that have been severely affected should be verified with the Provincial fishery office.

Fish hatcheries

Few reports are available but a grouper hatchery in Sarasin Bridge Phuket was reported to have been damaged. The government stations are reported not to have incurred any significant damage.

Fish cage culture operations

There are extensive reports of damage and loss to cultured fish operations in cages. Cage culture sites on the west Coast of Thailand are typically in the mouths of estuaries and seaward parts of delta and mangrove areas. These areas are exposed to the rapid rising waters and wave of the tsunami and their typically fragile construction resulted in the break up of some of the cages and loss or escape of the stocks.

Impacted fish cage culture operations

		Owners affected	Area of cages affected (m²)
Ranong		583	827,008
	Meuang	288	260,070
	Kapoe	139	69,309
	Branch dist suk sam ran	156	497,629
Phangna			87,194
	Takua Pa		12,726
	Takua thung		17,973
	Tai Meuang		9,351
	Koh Yao		26,653
	Kuraburi		26,653
	Meuang		7,812
Phuket		315	45,172
	Meuang	174	29,893
	Krathu	4	0
	Glang	137	15,279
Krabi		359	74,108
	Meuang	40	24,174
	Klong thom	102	5,669
	Neua Klong	50	26,532
	Ao Leuk	107	12,213
	Koh Lanta	60	5,520
Trang		393	19,554
	Kantang	67	10,850
	SikAo	139	6,192
	Palien	163	2,272
	Branch dist Haad samran	24	240
Satun		960	70,140
	Meuang	343	5,760
	La Ngu	617	58,859
	Thung Wah		
Total		2,610	1,123,176

In Phuket, Krabi, Satun, Ranong and Trang there are reportedly 2,610 owners affected with a reported cage area of over 1,035,982 square meters (approximately 41,439 cages at average size of 25 m²). Phangna province has also a large area of cages impacted (87,000 m²). It is not clear whether these cages have been completely destroyed, completely lost the stock or have lost some stock. The current government estimate of the losses from aquaculture cages is approximately US\$92 million (3,803,000 Baht)

The compensation package for cage farms is rather low compared to the price of the cage and value of the stock. The compensation for an average cage (25m²) would be 3,750 baht and the total compensation allowable (maximum 80 square metres is 12,000 baht). This can be compared with the following approximate data for the cost of a cage and the stock contained:

Typical cost to build a cage is about 16,000 baht per cage (25 m²) [verify]

Cage size range 16 to 36 square metres each (4x4, 5 x5 and 6x6 metres are typical sizes) and owners typically have several cages.

Fish are stocked at 10-20 kg of fish per square metre (typical cage loading about 100-200 kg [verify this]).

Value of fish contained is variable (about 120-160 baht per kilo of sea bass and 250-300 baht for grouper).

The approximate value of the stock (if fully stocked and at harvestable size) would be 10,000 – 20,000 (sea bass) and 20,000 to 40,000 for grouper per cage (25m²). [verify this]

The ratio of grouper to sea bass farms is about 80:20 [verify this]

Shrimp hatchery impacts

Most shrimp hatcheries were not damaged in the Haad Rawai and Chalong bay area of Phuket (southern bay) but there are reports of damage to water intakes (under sand filters etc.) being blocked by tsunami sediment and physical disturbances.

There has been complete destruction of shrimp hatcheries in the Khao Lak area of Phangna province. Some figures (based on area) are provided by DOF but they are almost certainly not complete (the mission observed at least 22 hatcheries destroyed in the Khao Lak / Ban Nam Kem area alone), these were mainly medium scale operations but one very large hatchery was also completely destroyed. The apparent compensation level offered (150 baht per square metre up to a total of 80 metres) is very low relative to the actual investment made in construction and operation of a shrimp hatchery (most of the damaged hatcheries observed had an area (concrete tanks) well in excess of 150 square metres).

The loss of the hatcheries in Phangna will affect supplies of post-larvae to the Thai shrimp industry, however in terms of overall number of the nations hatcheries that are out of commission, this is still a limited percentage.

Shrimp farms

There have been few *reports* of damage to shrimp farm operations. This probably because there are relatively few farms on the west coast of Thailand (as compared with the Gulf of Thailand coast) and the fact that many farms are not in the immediate coastal strip. Those farms that have been damaged are located in the immediate vicinity of the shore on low-lying land. Very few shrimp farm operators have reported losses or damage for compensation (this may be because the compensation level offered is very low (3,800 Baht per rai) and is therefore not worth the claim.

The figures presented by the Phuket fishery Rescue centre indicate a large number of farmers affected in Trang (1,910) and Satun (1,274) however the are of reported loss is minimal (a total of about 179 rai). It is worth verifying that shrimp farms were not significantly affected.

Shellfish concessions

These are principally cockle beds and green mussels, although in Phuket, there is also oyster and land based abalone operations that may have suffered some damage. The rehabilitation of these sites is probably not a major equipment issues but related more to restocking or reseeded and the time taken to get a new harvest.

Preliminary recommendations for action:

Short term

- Targeting and ranking of impact (utilize DOF losses information by village, Provincial records of other damage, NGO reports).
- Separate in to severe, medium and minor impacts
- Needs assessment – FAO mission and ensure liaison with Provincial fisheries officers and NGO's active in fisheries sector and fishing villages
- Establish a plan for support to affected communities
- Ensure that support does not duplicate government support or adds value

- Equipment replacement as a short-term response, longer-term community organization in fishing communities may be possible.

Short/medium term

- Enable access to small-scale grants facility for communities that have organized (with UNDP?) – get NGO groups to assist communities to access these funds.
- Damaged hatchery operations most likely cannot be assisted as these require infrastructural rehabilitation and stock replacement.
- Damaged cage culture operations may be assisted, as the government compensation package may be too low.

SECTION III: ENVIRONMENT

Several national parks along the coast have been severely damaged. Over 200 million baht of property and infrastructure has been destroyed. The mission visited Sirinat National Park where 28 people had died and the park had sustained extensive damage to infrastructure in the tourist reception area. In the Thai Luang National Park a turtle breeding facility was damaged, although most of the turtles survived and were transferred to another facility. A major clean-up operation by school kids was underway in both parks.

The priority for the Marine National Park Division, Royal Forest Department, is now to rebuild infrastructure and place it further away from the shore to protect from future disasters. The Department asked for technical assistance in re-zoning the national parks to become more tsunami resistant. The Department thinks this is an opportunity to renovate and rethink.

The coral reefs along the Andaman coast are not only indispensable for marine wildlife in the area, but are also a crucial source of income for the tourism industry and local communities. Future development of sustainable eco-tourism and the recovery and diversification of livelihoods in fishing communities will depend on the restoration and protection of the coral reefs.

At first it was feared that much of the coral reef along the Andaman coast had been smashed to pieces by the giant waves. The mission found however that the damage, while serious, is much less than originally thought. The Department of Coastal and Marine Resources estimates that on average about 5% of the coral reef along the coast and around the main islands has been damaged. Tsunami waves only tend to damage coral reefs in shallow areas, while corals below a depth of 7 meters are not affected⁷.

Problem areas include:

- South Patong Beach, Phuket: 20% damage, mainly from debris sucked out from tourist resorts. We were shown underwater footage of coral reefs littered with suitcases, kitchen sinks, television, deck chairs, building material, hangers, etc.
- Koh Pai (part of Phi Phi): 40-50% damage, mostly 5-7 meters depth. The extent of the damage is because most of the corals in this area are of a fragile branchy type.
- Rana Bay: 40-50% damage, same reasons as Koh Pai
- Similan Island: No figures yet, but an initial look by Department divers indicate extensive damage due to sedimentation. It would seem that the steepness of the coral reef resulted in a lot of sand being deposited on top of the corals. If not clean off, this sand will eventually kill the corals.

It is estimated that the coral reef will recover within 3 years in the case of branchy coral and 5-10 years in the case of bunchy corals. Fish life does not seem to have been affected by the tsunami. Only moray eels and pony fish were seen washed up on beaches.

⁷ A full survey of the damage will be ready within 2-3 weeks

The Department is recommending that all affected coral reefs become off limits for recreational diving for several years. They are now launching a major clean-up operation. They asked for help in mobilizing about 100 volunteer divers each Sunday for the next 1-2 months to clean up debris from the coral and carefully put back into place pieces of coral that have broken off. UNDP offered to procure equipment needed for this operation and the Department will provide a list of needs to UNDP by 11 January.

The destruction of tourist resorts, especially on Phi Phi Islands, presents the Thai authorities with an opportunity to re-think development plans and introduce and enforce stricter zoning laws. The Governor of Krabi said in a statement to the press that he wants Phi Phi to become primarily a day-trip destination with only few resorts located on the hillsides. In addition, the Ministry of Natural Resources and Environment announced on 6 January a radical new approach to zoning and environmentally sound coastal management, especially in Pangnga, Phuket, and Krabi provinces.

There is an urgent need technical assistance in the area of eco-tourism planning, zoning, area management for national parks and beyond, including Phi Phi.

NEXT STEPS

In terms of immediate next steps, the mission proposes the following:

Livelihoods sector in general:

1. Participatory Disaster Assessments undertaken to avoid top-down approach in providing assistance to affected communities (World Bank to take lead)
2. The government and the civil society is considering to replicate a programme similar to the Social Investment Fund - Menu 5 and the World Bank is happy to support this initiative. UNDP may consider joining this initiative as well.
3. Formulation of a UNDP/CODI project for support to communities in rebuilding their lives, shelters, and livelihoods (details provided in the meeting reports, see Annex 5)

Fishery sector:

4. Further discussions with the Department of Fisheries and the formulation of a joint FAO/UNDP project to support national efforts in rehabilitating small-scale fishery, including schemes to supplement government compensation for the replacement of boats and fishing equipment, and promotion of alternative livelihoods. (FAO to field a consultant by 17 January to undertake formulation).

Environment sector:

5. Emergency support to coral reef clean up operations (help mobilize volunteer divers and procurement of urgently needed equipment). Medium term support may also be needed, including clean-up of beaches around Phi Phi Island
6. Expertise in the zoning and area management is needed for both national parks.
7. Support to DMC and Department of Mineral Resources in providing experts and equipment for the assessment of coastal erosion.
8. Technical Assistance in the area of eco-tourism planning, zoning, area management for national parks and beyond, including Phi Phi
9. Formulation of a UNDP project document, in cooperation with UNEP, for coordinated support to the DMC in above areas.

Annex 1 : Records of vessels and reported damaged/lost vessels⁸ for the 5 tsunami affected provinces (current 15.00 5th January 2005)

Province	District (Amphur)	Areas of losses		Registered vessels		Vessels damaged/lost		Vessels retrieved	
				>10 ม.	<10 ม.	>10 ม.	<10 ม.	>10 ม.	<10 ม.
		Sub-district	Village	Large	Small	Large	Small	Large	Small
Ranong		7	22	587	1,408	191	297	13	27
	Meuang	2	11	445	843	51	87	2	6
	Kapoe	2	7	57	351	47	98		
	Branch Dist. Suk Samran	3	4	85	214	93	112	11	
Phangna		15	73	825	2,782	284	607	107	153
	Takua Pa	4	11	231	213	81	57	51	17
	Takua Tung	2	13	68	714	0	45	0	1
	Tai Meuang	2	7	144	102	119	157	49	67
	Koh Yao	2	14	133	576	11	206	5	63
	Kuraburi	4	23	190	518	11	206	5	63
	Meuang	1	5	59	659	73	139	2	2
Phuket		8	81	574	676	476	636	157	41
	Meuang	6	42	422	411	381	426	157	39
	Krathu	2	11	27	11	22	31	0	0
	Tha Lang		28	125	254	73	179	0	2
Krabi		23	123	312	2669	147	775	1	44
	Meuang	6	34	167	674	7	169	1	0
	Klong Thom	5	19	26	364	0	7	0	20
	Neua Klong	4	18	44	830	0	160	0	24
	Ao Leuk	3	16	55	345	12	34	0	0
	Koh Lanta	5	36	20	456	128	405	0	0
Trang		12	51	626	2365	0	594	0	0
	Gantang	4	14	577	1019	0	375	0	0
	SikAo	3	12	31	476	0	84	0	0
	Palien	3	13	7	463	0	25	0	0
	Branch Dist. Haad Samran	2	12	11	407	0	110	0	0
Satun		9	36	783	2172	29	493	5	49
	Meuang	5	15	460	1165	0	142	0	19
	La Ngu	4	21	323	1007	18	313	5	30
	Thung Wah	3	10			11	38	0	0
Total		74	386	3,707	12,072	1,127	3,402	283	314

⁸ Comments: Phuket province numbers include 87 large tourist vessels and 76 small tourist vessels (converted fishing boats). These can be separated from actual fishing vessel losses. For other provinces all vessels are for fishery purposes

Annex 2 – Impacts on aquaculture production (information is incomplete and liable to change)

Province	Amphur	Cage (m2)			Culture pond (rai)			Shellfish areas (rai)		
		Registered	Cases	Area (m2)	Registered	Cases	area lost	Registered	Cases	affected
Ranong			583	827,008						
	Meuang		288	260,070						
	Kapoe		139	69,309						
	Branch Dist. Suk Samran		156	497,629						
Phangna				87,194			60			
	Takua Pa			12,726			50			
	Takua Tung			17,973						
	Tai Meuang			9,351			4			
	Koh Yao			26,653			6			
	Kuraburi			26,653			6			
	Meuang			7,812						
Phuket		26,025	315	45,172	2,214	294	6	707	7	397
	Meuang	13,492	174	29,893	482.07	88	5	452	5	357
	Krathu	402	4		4.58	12				
	Tha Lang	12,131	137	15,279	1,727	194	1	255	2	40
Krabi		32,039	359	74,108	13,009	921	113	7,723		30
	Meuang	5,562	40	24,174	1,426	187	65	900		
	Klong Thom	8,827	102	5,669	2,073	250	5	1,500		
	Neua Klong	7,589	50	26,532	2,659	256				
	Ao Leuk	5,472	107	12,213	1,798	154	40	700		
	Koh Lanta	4,589	60	5,520	5,053	74	3	4,623		30
Trang		214,936	393	19,554	45,743	1,910				7
	Gantang	7,360	67	10,850	41,049	959				2
	SikAo	73,152	139	6,192	1,063	217				3
	Palien	132,800	163	2,272	2,277	521				2
	Branch Dist. Haad Samran	1,624	24	240	1,355	213				
Satun		34,360	960	70,140	1,393	1,274		8,909	17	-
	Meuang	15,488	343	5,760	880	467		8,909	17	
	La Ngu	18,872	617	58,859	512	807				
	Thung Wah			5,521						
Total		307,360	2,027	1,123,176	62,358	4,399	179	17,340	24	434

Annex 3 - Table of reported losses/damage to tourist boats.

Province	District	Sub-district	Village	Vessels lost/damaged		
Krabi				342	30,964,100	
	Meuang			311	28,458,600	
	Meuang	Krabi yai		1	95,000	
	Meuang	Krabi noi	8	1	15,000	
	Meuang	Kao kram	5	1	60,000	
	Meuang	Yao tong	2	8	356,000	
	Meuang	Yao tong	3	1	60,000	
	Meuang	Yao tong	4	2	120,000	
	Meuang	Yao tong	6	2	75,000	
	Meuang	Klong prasong	1	12	700,000	
	Meuang	Pak nam		4	315,000	
	Meuang	Lai tai	2	1	145,000	
	Meuang	Lai tai	5	11	885,500	
	Meuang	Lai tai	6	17	1,071,000	
	Meuang	Ao nang	1	6	415,000	
	Meuang	Ao nang	2	16	2,787,800	
	Meuang	Ao nang	4	4	363,400	
	Meuang	Ao nang	5	2	192,000	
	Meuang	Ao nang	6	3	400,000	
	Meuang	Ao nang	7	69	6,873,200	
	Meuang	Ao nang	8	21	2,342,000	
	Meuang	Ao nang		3	266,000	
	Meuang	Ao nang	Ao nang long tail tourist boat coop		125	10,901,700
	Meuang	Nong talay	2	1	20,000	
		Koh lanta			5	400,000
	Koh lanta	Koh lanta yai	7	2	140,000	
	Koh lanta	Koh lanta yai	4	1	80,000	
	Koh lanta	Klong yang	2	2	180,000	
		Klong thom			4	220,000
	Klong thom	Hooa nam kAo	1	1	65,000	
	Klong thom	Klong pon	9	1	45,000	
Klong thom	Klong pon	10	2	110,000		
	Ao leuk			6	460,000	
Ao leuk	laem sak	2	2	130,000		
Ao leuk	laem sak	3	2	170,000		
Ao leuk	laem sak	5	1	80,000		
Ao leuk	Ao leuk	5	1	80,000		
	Neua Klong			16	1,425,500	
Neua Klong	daling son	3	5	395,000		
Neua Klong	daling son	5	4	525,000		
Neua Klong	Neua Klong	3	1	95,000		
Neua Klong	Klong kanan	3	1	90,000		
Neua Klong	sri bor yah	1	1	100,000		
Neua Klong	sri bor yah	2	2	210,000		
Neua Klong	sri bor yah	3	1	3,500		
Neua Klong	sri bor yah	8	1	7,000		
Phangna				19	2,874,000	
	Koh Yao			18	2,794,000	
Koh Yao	Koh Yaonoi	4	1	70,000		
Koh Yao	Koh Yaonoi	5	2	585,000		
Koh Yao	Koh Yaoyai	2	3	230,000		
Koh Yao	Koh Yaoyai	4	7	564,000		
Koh Yao	Phru nai	3	5	1,345,000		
	tai Meuang			1	80,000	
Tai Meuang	Sam sen	3	1	80,000		
Phuket				2	350,000	
	Meuang			1	150,000	
Meuang	Talad yai			1	150,000	
	Giang			1	200,000	
Giang	Thep kasetri	5		1	200,000	
			Total	363	34,188,100	

Annex 4

Tasks to be added to FAO consultant TOR.

- Contact CODI (for the outcome of the NGO meeting and the intended follow-up action. Summarize the report
- Contact NGO Coord , Wildlife Fund Thailand, YadFon and other NGO's active in the five provinces.
- Request access to the assessment information that they are currently developing. Summarize the important needs that have been determined.
- Cross check the NGO information with the Provincial information on affected areas and the DOF information on villages where losses to fisheries and aquaculture impacts have occurred.
- Look at this combined analysis and try and develop a ranked series of impacted villages that warrant support in the fisheries sector.
- Liaise with the Phuket Fishery Rescue Centre and share the information with them.
- Participate in the 17th January meeting to be arranged by CODI.

Contacts in fisheries in affected provinces

- Hassenai Kongkeo :Fisheries consultant to FAO on tsunami impact assessment in Thailand & advisor to NACA. (065445410)
- Khun Niwat : Coordinator of Phuket fisheries rescue Centre (076-391-515)
- Praulai Nootmorn: Chief of survey & analysis of aquatic resources and fisheries status. (076-391-138 to 40 ; mobile 01273-5837 afdec@phuket.ksc.co.th)
- Khun Vichien, Director of Phuket Fisheries Centre (01-3297215)

NGO contacts:

These are the contacts that we have in South Thailand:

- Mr Pakpoom (01-8026131) – He works for NGO Coord and is close to the Southern Fisher folk Federation of Thailand
- Mr Wichosak – tel: 01-9564290 – He is the General Secretary of the fisher folk Federation
- Mr Banjong – tel: 01-4795213 – He is the Director of the Southern Coastal Zone Project (he works closely with the Federation)

- Andaman Sea Fisheries Development Center (AFDEC) 77 Sakdidej Road, Ao Kham, 83000 Phuket Director PAolo Montaldi Email: montaldi@loxinfo.co.th , a_montaldi@hotmail.com (+66 076 391138 +66 076 391140 Fax: +66 076 391139)

Fisheries

- Win Latt (consultant Ranong): (66-77) 830 417, (66) 01 737 0745 , 01 476 3945 aquabco@cscoms.com - could do assessment for southern Myanmar and also perhaps impacts on Burmese migrants in fisheries and shrimp culture in Ranong.
- Heiko Seilert (EU Charm Project Krabi) 01 909 2422 heiko_seilert@hotmail.com
- Jate Pimoljinda (Krabi/Phangna) work (66-7) 569 5149 to 51 mobile (66) 01 892-5706 jpafdec@phuket.ksc.co.th

Shrimp hatcheries / farming:

- Pornlerd Chanrathchakool (Bangkok/Phuket): 016440554
- Matthew Briggs (consultant - Phuket): 078083544
- David Garriques (CP Ltd. Bangkok/ Phuket):

Annex 5

Detailed Report of Meetings

5 Jan – Meeting with OCHA for briefing

Place: City Hall, Phuket

Persons: Head of OCHA team, Terje Skavdal

Issues of discussion:

- *Early recovery.* Immediate concerned issue is how to get people life back to normal. Particular focus should be given in providing shelter and means for living, repairing schools. The most vulnerable groups are those from fishery industry and their families.
- *Rescue of dead bodies.* The forensic work has been going on well with more than 30 international forensic team and more than 300 staff on the fields. The forensic process has been divided into four stages. However, there is a need to streamline the process as different teams have different protocol.
- *Colin Powell's visit.* The US Secretary of State, Colin Powell raised three issues of concerns that each affected country should try to handle immediately. These are
 - i) establishment of warning system;
 - ii) environmental recovery; and
 - iii) identification of missing people.
- *Fishing industry.* Fishing industry is most affected from the tsunami. Around 490 fishermen villages are affected. Immediate concerned issues include
 - Losses of fishing boat which results in lack of mean for living, leaving the fishermen and their families vulnerable to loss of income.
 - Recovery assistance provided by provincial offices. The provincial fishery department is currently registering for loss and damage boats and ships. Support for both technical and financial will be provided.
 - Migrant workers in the industry including those from Myanmar may not receive assistance. So far the Myanmar government does not initiate any means of assistance to this group of population. Extension of assistance to cover this group of population is under discussion.

5 Jan – Meeting with head of national parks

Place: Sirinath National Park and Haad Thaymuang National Parks, Phuket

Persons: Mr. Songtham Sooksawang, Director of Research Division, Department of National Park Wildlife and Plants

Current assessment:

- Most houses and lodges in both national parks were destroyed by the tsunami.
- Number of casualties was minimal in both parks.
- Most debris has been cleared out of area.
- At Haad Thaymuang, urgent recovery is needed as the beach is the nesting site for two species of sea turtles, the Leatherback and the Olive Ridley. More importantly, it is during this time of the year where sea turtles would come ashore to lay their eggs.
- No school and health centre were damaged, as most are located further in land.

- Less impact in terms of houses and belongings of local people as most of them live further in land. However, those who involved more or less in tourist industry are partially affected.

Issues of discussion:

- *Zoning.* Despite damages caused by the tsunami, the tidal waves that affected these national parks provided a good opportunity to manage the areas i.e. zoning the national park with different areas for different purposes.
- *Marine ecology.* Around 5-20% of coral reef has been destroyed by the tsunami. The national park is currently trying to assess other possible affected areas.
- *Garbage management.* Damage caused by the tsunami left behind debris. Currently, local communities include girl scouts and boy scouts are helping to clean the area. However, a plan for cleaning up garbage both at the beach site and under the sea is being prepared.
- *Joint venture with private sector.* With houses and lodges being destroyed by the tidal waves and with the zoning being implemented soon, the officer in charge of the national park is seeking for a possible joint venture with private sector to re-build the houses and lodges in particular areas.

Possible supported areas:

- Expertise in the zoning and area management is needed for both national parks. If support can be provided, the expert is needed for 1-2 months to work closely with the staff from the national park to lay down plan and divide areas for proper zoning.

Date : Jan 5 – Discussion with communities leaders.

Place : Baan Naam Khem Village, Takhua Pa, Phang Nga

Persons : Khun Yupin (Phang nga - academia, former teacher, SIF and community plan participant)
 Khun Sucheep (Ranong – civil society, formerly work with Dr. Pholadej)
 Khun Theerapat (Work mainly with LDI in reserving Andaman sea)

Current assessment:

- Provincial snapshot showed that Phang nga is the most affected areas with five districts are being hit by the tidal wave. 65 kilometres of area along the coast are badly damaged. Among these several villages such as Baan Nam Khem and Baan Bang Niang are almost being wiped out.
- Apart from the tourist industry, the fishing industry is also badly affected. Large number of boats, ships and cages are lost or completely destroyed.
- A large number of workers in the fishing industry are migrant workers both from Myanmar and from other parts of Thailand. Currently, there is no official assistance provided to migrant workers from Myanmar. However, most of them have received the same assistance as local people. There has been no official assistance provided by the Myanmar government.
- Assistance and support are insufficient especially in both Satul and Trang, comparing to those in Krabi, Phuket and Phang Nga where most of the affected population are foreigners and those in the tourism industry. However, in both Satul and Trang the most affected group are local people and fishermen and are currently received less support.

- After immediate recovery, local people need to get back to their normal lives and immediate needs are means and appliances for them to start working again. Small-scale fishermen and migrant workers need to start fishing but they still lack of appliance especially boats and ships. However, provincial fishery department is currently working on register those affected fishermen and estimate the total losses so that proper technical and financial support will be provided. Officials are currently working on an aid package for these fishermen with an objective to get them to return to their normal life.
- While there are some schools being damaged from the waves, most students and teachers survived. Currently, the damaged schools are being re-constructed while teachers and students of affected schools are being transported to share classrooms with nearby schools. However, children, whose parents are mainly fishermen and currently loss their incomes, are being affected as they do not have daily allowance to attend school.
- Most local people are overwhelmed with donations both directly from people and from organizations. However, most of these are clothes and dry food, which so far are more than plentiful.
- The NGO network will have a coordination meeting on January 17 in Phang Nga Secondary School to call for NGO collaboration and strategic move for the emergency relief and strategic plan for the rehabilitation.
- LDI representative noted that there were a number of migrant workers from Burma both registered and unregistered but had no right for compensation. In Nam Kem, majority had no land right. This would be problem in zoning for permanent shelter and relocation of villagers. LDI suggested that there should be self assessment by the community, informal mechanism run by the civic group network, learning from the previously affected communities (hit by the Typhoon) on the rehabilitation plan and alternative jobs, creating community leaders, and community participation in Zoning.

Issues of concern:

- *Psychological effect after the tsunami.* It is possible that tsunami victims may suffer from the post traumatic stress. Psychological problem may take place not only among lost families and relatives but also health workers. Among these, the most vulnerable groups of people include children, orphan, old age, Mogen tribe and illegal workers.
- *Management and coordination.* While support are being provided, a coordination across not only different government agencies but also among different NGOs and development partners is needed to ensure that they are not overlapped and that support would reach the affected people. A proposition has been made to ask the provincial governor to serve as a focal point for each province.
- *Financial support.* Local people now need financial assistance to get back to their normal life. This transferred fund could be used to buy tools for them to start working again.
- *Lessons learned.* These community leaders and NGOs proposed that government and other organizations share experiences and lessons learned especially from the previous disaster such as Gey Tornado that took place in Thailand several years ago. Lessons could be drawn on how government responded back then and what worked and what did not so it could be applied to current situation.
- *Involvement of NGOs.* NGOs can assist not only in terms of working closely with government and providing financial support but it can also serve as watchdog for the rehabilitation to ensure the transparency of the system.

- *Community participation.* Participation from community is needed during the recovering period. Given that public sector are not familiar in working at the community level and that most communities know each other, the participation of the community will not only ease the recovery but may ensure that assistance reach the target group. The experiences from the implementation of SIF showed that strong community will be able to get access to financial support as well as proper assistance from the public sector and channel it to the appropriate group of people.
- *Systemize the industry.* The damage causes by the tsunami in several industries provide an opportunity for a proper plan to be laid down for a better system.

Possible supported areas:

- Several of these community leaders have experiences in implementation of SIF program. Most of them believe that assistance in the form of SIF would not only revive the local economy but will also ensure sustainable recovery. In this case, the development partners could act as facilitators both at the community levels and at the government level in channelling resources to the community and ensure that community is involved in any assistance.

Date: Jan 6 – Department of Marine and Coastal Resources

Place: Phuket Marine Biological Centre

Persons: Khun Sombat (acting director of centre), Mrs. Cherdchinda Chotiyabuttra, Director of Planning and Research Division, Department of Marine and Coastal Resources, and Mr. Somkiat Khokiatwong, Phuket Marine Biological Research Centre (PMBC)

Current assessment:

- A coral Reef survey on Dec 30, 2004 showed that most coral reefs are not affected by the tsunami. Most of them are badly damaged by the development of embankment.
- In Phi Phi Island, about 20-50% of coral reef are damaged, depending on the area. 5 areas are badly damaged such as in Kho Pai. Recovery will depend on component of areas i.e. surroundings and quality of water. Some might take more than 3 years. In addition, areas where coral reef are more than 50% damaged are being proposed to be closed down. Intensive survey on coral reef will be conducted in the next 4-6 months. This will include a survey on affected species in the coral reef areas.

Possible supported areas:

- Support to DMC to help cleaning up the coastal areas. The clean up scheme will be on every Sunday starting this Sunday. There are a number of clean up spots and the clean up will continue for months. Emergency procurement will be:
 - small ships to carry the heavy stuff from the water
 - equipment to lift the heavy materials
 - Estimated budget will be concluded by Monday January 10 by PMBC
- Support to DMC and Department of Mineral Resources in providing experts and equipment for the assessment of coastal erosion. The rapid survey needs to be done by April.

- PMBC will give more details on Monday January 10
- National Park Zoning UNDP will contact DNP (Mr. Songtham) on the need for tools or expertise in National Park zoning and management.
- Detailed proposal will be concluded by next week (January 14)

Date Jan 6 – Visit to Koh Phi Phi

Persons: Mr. Mitchai Anantanasakul, Chief of PP National Park

- The mission went to PP Island for survey the destruction.
- Met the Chief of PP National Park Mr. Mitchai Anantanasakul.

Possible areas of support

- Suggested needs were environmental rehabilitation, Zoning, drinking and wastewater treatment system, solid waste management, and warning system. In fact zoning plan was done but has never been in use and now it's the time to implement, one month after the cleaning up the destruction.

Date: Jan 7 – Visiting fishing villages

Place : Kho Saray, Rawai beach, Karon beach, and Patong beach.

Current assessment:

Persons: Village people, fishermen, Morgan ethnic group.

- Most local fishermen, especially those with small scale, are badly affected. Some of them are still being afraid of going back to the sea.
- Most boats are repairable. Damage usually to engine and/or hull.
- Financial support is needed to start their business again.
- Rajapat University students volunteering to fix boat engines in one village
- American Christian NGO found in one village re-building a house that belonged to a disabled person

Date: Jan 8 – CODI

Place: Bangmuang Relief Center and Temporary Shelter

Persons: Ms. Somsook Bunyabancha, Director of Community Organization Development Institute (CODI), Public Organization under the ministry of Social Development and Huamn Security and Mr. Amporn Kaewnoo, Manager of CODI Southern Branch

Overview of Loss as of January 4, 2005 (see chart)

Housing totally damaged 715 houses

Fishing boat damaged 2,473 units

These figures exclude loss of Takua Pa district in Phang Nga that needs some time to be concluded. Estimated figures in Takua Pa are 2,000 houses damaged and 1,000 fishing boats.

Note: Surveyed by Southern Fisher folk Association (CBOs network in Andaman coast), in cooperation with CODI, NGO-COD and Friends of Andaman

Actions by CODI

CODI has direct responsibility for the 3 relief centres and temporary shelter in Phang Nga as follows:

1. Bangmuang Relief Centre There are more than 800 households registered from nearby

community especially, Nam Kem - the most affected areas where approximately 1,000 people (25% of the community) found dead. Expenditure for this centre is 1 million baht daily.

2. O.B.T. Kugkak Relief Centre There are about 100 households from 3 communities

3. Tabtawan Relief Centre There are about 70 fisher folk households

Other relief centres are scattered around and be responsible partly by CODI and other agencies.

Basic support up to now, are:

1. Providing emergency shelters (tents)

2. Temporary shelters being built to replace tents and expected to be done by the end of this month (January)

3. Distribution of donated cloths, food and some household suppliers

4. Contact and collect affected families who moved out to relatives and elsewhere back for the survey of needs and future decision

5. Take care of children in the relief centres (about 300 in Bangmuang), bring them back to school and provide day care centre.

What CODI plan to do step by step

First phase from now to end of March

1. Build temporary shelters for all registered in the relief centre by January

2. Manage the temporary livelihoods in the relief centre - physical accommodation and mental security

3. Develop "Community Organizing" for the affected communities facilitated by CODI staff and brotherhood communities (CODI CBO network) as mentors.

Second phase from March to June

1. Develop community livelihood plan with community participation

2. Spatial plan of the community that includes zoning of various groups of interest

3. Decision for occupation - fishing, other alternative earning and obtain facilities/equipment for the start up

Third phase from June

1. Permanent shelters in the affected communities including the provided rehabilitation areas.

2. Implement the community livelihood as planned - fishing, alternatives

What UNDP can response (in consultation with CODI)

It is proposed to focus UNDP support to CODI in the 3 relief centres according the above phases

1. Provide temporary shelters for the 3 relief centres by now to end of January

200 units @ 20,000 = 4,000,000 baht (equipment and raw materials)

2. Facilities for kids in the relief centres to schools (books, utensils, bus and gasoline to school, lunch) from January to March

300 pupils @ 3 months @ 5,000 = 4,500,000 baht

3. Provide households supplies for cooking and daily lives (not provided by the donated stuff)

200 households @ 10,000 = 2,000,000 baht

3. Provide micro finance. (by March) lent to fishermen (for new boat and fixing) before the compensation (that takes time) After the compensation, the lending money will be turned back to the community as revolving fund to implement the livelihood plan and demonstration of alternative jobs such as boat building.

300 fishing boats @ 30,000 = 9,000,000 baht

3. Support the "Community Organizing" process as the preparation for permanent community livelihood (from now to March) and development of community livelihood plan (from March to June)

Expenses for travel, training materials, printing, and communications
30 coordinators and community mentors @ 30,000 @ 5 months = 4,500,000 baht
Total support from UNDP in phase one and phase two = 24 million baht (600,000 US\$)

4. Support for phase three - Implementation of community livelihood plan (6-12 months from June 2005)

UNDP support will focus on selected communities suggested by CODI (about 3-5 communities)

Implementation of the livelihood plan will be for instance:

- Micro-finance management and accounting
- Landscape design according to the livelihood and zoning
- Construction of permanent shelters

- Alternative livelihoods (alternative occupations) mentored by brotherhood communities (Study trips, training. community participatory forum, demonstration projects)

Estimated budget for phase three is 500,000 US\$ (details to be identified during the operation of phase one and phase two)

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NOTE

CODI and Plan Architect (a private architecture company) join hands in developing the design of landscape in the affected communities in Phuket such as Rawai beach, Sirei island, Kamala beach, including other Morgan communities. Housing in these areas are partly damaged but communities has no ability to fix the houses. Official compensation is not done properly and communities set up like slum really need to be redesigned. CODI approach is to move quickly on the design and then convince communities and the local government to adopt the renovation of habitat.

UNDP can provide support for shelter in these areas. CODI and this architecture company plan to discuss with O.B.T. (Tambon Administration Organization) who has direct responsibility in transferred budget for compensation to these communities.

Another site with this joint efforts (CODI and Plan Architect) is Prathong Island in Phang Nga where comprehensive aspects of rehabilitation can be done (both natural resources, alternative livelihood, and habitat design)

Annex 6

Itinerary

January 4th, 19:00: Arrival in Phuket

January 5th,

8:30-9:00 am: meeting with the UNDAC team, briefing on the mission purpose, briefing from UNDAC on overall situation in Phuket.

9:00 to 11:00 am: meeting with National park officials on site, briefing on Tsunami impact on national parks, sites visit at Sirinath and Thai Muang national parks, North of Phuket

11:40 to 12:45 visit of Ban Nam Kaem fishing community in Takua Pa district, Phan Nga

13:30 to 15:45 meeting with representatives of the civil society, CBOs and NGOs working in the affected areas, briefing on the ongoing relief efforts and general situation of coastal communities.

16:00 to 17:00 site visit in Khao Lak devastated resorts area

18:00 returned to Phuket

January 6th,

9:00 am: meeting at the Marine Biodiversity Centre, briefing on Tsunami's impact on marine ecosystems and marine parks

10:00 am: departure by boat to Koh Phi Phi Don island

12:30 to 15:30: visit of devastated Kho Phi Phi Don

17:30 returned to Phuket

January 7th,

9:00 to 10:30 am: visit of Chalong Bay (Tuk Kae) morgan community.

10:45 to 12:00 visit of Phuket fishing port

13:00 to 14:00 visit of Rawai morgan community

14:00 to 16:00 visit of Phuket west coast (Kata, Karon, Patong, Kalim, Surin) bays

18:20: departure to Bangkok for most of the team

January 8th, (K. Phansiri Winichagoon, UNDP)

Daylong: meeting with CODI in the field.

Return to Bangkok in late afternoon.