



FAO ASSESSMENT OF TIMBER DEMAND AND SUPPLY FOR POST- TSUNAMI RECONSTRUCTION IN INDONESIA

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EXECUTIVE SUMMARY

Overview: The earthquake and tsunami that occurred in the Indian Ocean on 26 December 2004 had a large impact on Aceh province. Nearly 5% of the population (125,000 people) was killed while approximately 10% of the population was displaced (400,000 people). Considerable damage was also inflicted on houses, buildings, ports, bridges, telecommunications, water and electricity systems, crops, irrigation, fishery infrastructure, factories, and food and fuel outlets. There is also evidence of land subsidence in coastal areas. Trees and forests located along the coast were significantly damaged, although the total damage was small relative to the total forest resources in Aceh.

The capacity of the provincial forestry department, Dinas Kehutanan, was also significantly affected by the tsunami. The Dinas lost 49 staff, buildings, vehicles and management records. All FAO forestry programmes will be conducted in partnership with the Dinas and aimed at strengthening this department.

Supply considerations: Emergency and reconstruction programmes have already begun. The Aceh reconstruction programme will require large volumes sawn timber, plywood, and other wood products. This wood will need to be sourced from within the province, from other provinces in Indonesia and from wood imports.

Indonesia is one of the largest producers of wood in the world, with total annual roundwood production estimated to be approximately 60 million m³ per year. In principle, there should be plenty of solid wood products¹ available for Aceh reconstruction. In practice there are several factors that could complicate wood supply for reconstruction in Aceh:

- The annual consumption of wood products in Aceh is estimated to be 551,620 roundwood equivalent (RWE). The reconstruction programme is estimated to require an additional 415,000² m³ of solid wood products (740,000m³ RWE) will be required for reconstruction. Unfortunately total annual legal cut is only 50,000 m³ RWE and is insufficient for either domestic demand or reconstruction.
- Reconstruction activities, especially those funded by international agencies, are required to comply with the laws and regulations of the Republic of Indonesia, and in particular, the laws controlling the production and sale of solid wood products.
- Unfortunately illegal logging is widespread in Indonesia and is estimated to account for 40% and 80% of all logs produced. Most legal wood is produced for export sales and is actually difficult, but not impossible, to procure. This is potentially a significant problem for procurement of legal timber.
- Delivery of product to reconstruction programme has been made difficult by the destruction and damage to roading and shipping infrastructure.

¹ "Solid wood products" is defined as sawn wood, fiberboard, plywood and veneer.

² Reconstruction volume estimates include 90,000m³ roundwood for brick kilning.

Proposed FAO projects: Several programmes are proposed for the rehabilitation of the forestry sector and coastal forestry resources, facilitating supply of wood products for reconstruction, and assisting the Dinas Kehutanan to build its capacity to manage the forest resources in the province. Needs for technical assistance are identified for the following activities:

- Maximizing utilization of salvage wood and alternative wood supplies
- Establishing robust wood procurement framework and guidelines
- Preparing an integrated wood supply logistics plan for Aceh province
- Preparing a revised regional forest management plan for Aceh province

SOCIO-ECONOMIC SETTING

Estimates of Population and Infrastructure and the Impact of the Tsunami

Affects of the earthquake and tsunami on the population of Aceh Province

As of 2 March 2005, the estimates of deaths, missing persons and displaced persons in Indonesia caused by the earthquake and tsunami are shown in the table below.

Numbers of people affected by the earthquake and tsunami³						
Date	Deaths and Buried		Missing		Displaced	
	Aceh	N. Sumatra	Aceh	N. Sumatra	Aceh (in 20 districts)	N. Sumatra
02-Mar-05	125,313	130	94,682	24	400,062	19,620

Prior to the tsunami, the population of Aceh Province was estimated to be 4.4 million people. After the tsunami and earthquake nearly 5% of the population was dead or missing while approximately 10% of the population was displaced.

The total number of displaced people is estimated to be 419, 680 although unofficial reports indicate that this number will increase⁴. The Department of Public Works has built Temporary Location Centers (TLC's) to accommodate 90,000 persons, while the majority of the rest have found accommodation elsewhere in permanent housing and other forms of temporary housing.

³ UNOHCA (2005)

⁴ BAKORNAS is responsible for the compilation of these statistics. The estimated numbers of affected people is fluid due to the on-going evacuation process and the mobility of the population.

Affects of the earthquake and tsunami on infrastructure in Aceh Province⁵

The earthquake caused considerable damage to infrastructure throughout Aceh Province. The earthquake caused widespread damage to houses and buildings. There is also evidence of land subsidence in coastal areas.

The earthquake also generated a large tsunami that affected areas throughout Aceh and parts of North Sumatra. The worst affected areas in Aceh were Banda Aceh, the northwest coast and islands off the coast. The tsunami swept seawater and debris up to 5 kilometers inland and destroyed and damaged buildings, roads, ports, bridges, telecommunications, water and electricity systems, crops, irrigation, fishery infrastructure, factories, and food and fuel outlets.

The direct impact of the earthquake and tsunami on the wider Aceh forest resources and tree crop assets was relatively small but significant:

- Coastal trees, roadside trees, and coconut plantations suffered widespread damage.
- Coastal forests were heavily damaged, especially on the west coast. The area of coastal and mangrove forests pre-tsunami was approximately 48,925 hectares and it is estimated that 30% of this area (13,678 hectares) was damaged or destroyed.
- The main production forests in Aceh are located inland and the damage to them was negligible.

The flow-on impact of the earthquake and tsunami on forests and wood products is likely to be large:

- The Aceh reconstruction programme will require large volumes of sawn timber, plywood, and other wood products. Wood has been an important component in the construction of houses, boats, bridges, power poles, fencing materials, and other infrastructure.
- The reconstruction programme will also require large volumes of wood for manufacturing building materials. For example-
 - One house lot of bricks will consume between 6 to 9 m³ of fuelwood.
 - Concrete normally requires substantial quantities of timber for formwork.
- The increase in demand for wood from the reconstruction programme will need to be sourced from Aceh Province, other provinces in Indonesia or imported from overseas. The quantity of wood required will depend on the scale of reconstruction, the level of wood usage and level of substitution by other materials.

⁵ CGI (2005a)

Forestry Sector Statistics

National wood production and consumption

Total production: Estimation of national wood production and consumption in Indonesia is difficult because of ambiguous national statistics and also the high level of illegal activity. Various estimates have been prepared and some of these are summarized in the table below:

Analyst	Year	Industrial Consumption M m ³ RWE ⁷	Assumed Legal Harvest M m ³ RWE
Tacconi et al. (2004)	2001	56	10
Brown (2002)	2000	73	17
NRM-MFP-Bappenas FFWG (2004)	2003	53	17
Palmer (2000)	1997	108	43
Scotland (1999)	1998	84	52
ITTO**	2005	32.5	33***
BRIC (2003)*	2003	42	42***

* Export only ** Mill consumption figures for 2002 ***Assumes no illegal logging

For the purposes of this report we will assume that total roundwood production in Indonesia is approximately 60 million m³ per year. After accounting for roundwood exports, this is equal to roundwood consumption of approximately 0.272 m³ per person per year.

⁶ WB 2005

⁷ M m³ RWE = Millions of cubic meters in "Roundwood equivalent". RWE refers to log volume used to produce the wood consumed in its various forms.

Total legal production: According to the World Bank (2005), illegal logging provides between 40% and 80% of all logs consumed in Indonesia. The wide range in estimates of illegal logging reflects both the lack of reliable statistics in consumption and also the difficulty in defining legal production. For example:

- Indonesian societies still heavily depend upon subsistence use of traditional forest products for building materials – foraged or harvested on an informal basis. This is considered a customary right but generally does not fit within the definitions of legal production within the Forest Law unless conducted under a community forest license area.
- There are currently disputes between many provincial governments and the national government on who has the authority to issue harvest concession licenses. Since provincial governments issued almost all recent concession licenses, there is considerable doubt over the legal status of most wood produced in Indonesia. In Aceh province, the Dinas Kehutanan has undisputed right to issue concession licenses because the provincial government has special autonomy status.
- There are some schemes in place to provide verification of legality status of wood⁸, but few companies in Indonesia have met the standards set by those schemes.
- The quality of production documentation and level of public reporting is insufficient for most wood buyers to be able to determine legality of the purchased product.

The lack of verifiable legal wood in Indonesia poses significant problems to organizations that are committed or required to purchase legally produced timber. Apart from the difficulties in determining the legality of the product, legal wood is in short supply because most legal wood is exported or in high demand.

In addition, there is almost no wood produced in Indonesia that meets independent standards set for sustainable forest management and chain of custody; for example, according to Lembaga Ekolabel Indonesia (LEI) only 70,000m³ of solid wood products are produced annually that meet Forest Stewardship Council standards.

⁸ WWF GFTN, TFT and TFF organize separate schemes for supporting production of legal timber.

The latest figures available for total annual production by wood product category is for 2001⁹:

Estimated use of wood by sector, Year 2001								
Product ^b	Total Production (RWE m3)	% of Total RWE Production	% of Production Exported	Production for Export (RWE m3)	Domestic Consumption (RWE m3)	Domestic Consumption ^c (m3)	Domestic Consumption ^d (RWE m3 /capita)	Domestic Consumption ^d (m3/capita)
Log Exports ^a	6,468,400	11%	100%	6,468,400	0	0	0	0
Sawn Wood	11,520,000	19%	39%	4,492,800	7,027,200	3,513,600	0.03194	0.01597
Fiberboard	768,600	1%	87%	668,682	99,918	49,959	0.00045	0.00023
Particleboard	415,800	1%	100%	415,800	0	0	0	0
Plywood	16,790,000	28%	67%	11,249,300	5,540,700	3,047,385	0.02519	0.01385
Veneer	178,600	0%	8%	14,288	164,312	90,372	0.00075	0.00041
Pulp	7,781,475	13%	33%	2,567,887	5,213,588	1,303,397	0.02370	0.00592
Paper	16,161,525	27%	41%	6,626,225	9,535,300	2,383,825	0.04334	0.01084
Total	60,084,400	100%	54%	32,503,382	27,581,018	10,388,538	0.12537	0.04722

RWE = Roundwood equivalent

^a Log exports include estimates of illegal log exports from Kalimantan but not other provinces.

^b The product classification does not include fuelwood.

^c Domestic consumption is estimated by multiplying domestic production RWE by assumed conversion factors. The assumed conversion factor for sawn wood, fiberboard, and particleboard is 0.5. The assumed conversion factor for plywood and veneer is 0.55. The assumed conversion factor for pulp and paper is 0.25. No allowance has been made for imports, which are known to be relatively small.

^d The per capita consumption figures were derived using an estimate of population for Indonesia of 220 million persons.

These estimates should be treated with considerable caution because of the high level of uncertainty in the national statistics for the forest sector. Fuelwood for industrial (eg brick making) and domestic uses (cooking) is usually a significant end use of wood, which is not reflected in these tables.

⁹ Tacconi et al 2004

Estimates of wood consumption in Aceh Province

The consult was unable to obtain any specific data on local wood consumption in Aceh. It is likely that the majority of local wood consumption would be in the form of construction materials (predominantly sawn timber and plywood) and fuelwood for the kilning of bricks¹⁰. Estimates of the annual consumption of wood products in Aceh have been derived by multiplying the provincial population by per capita consumption estimates.

Estimates of Wood Consumption in Aceh Province				
Product	Per Capita		Total	
	RWE m3	m3	RWE m3	m3
Sawn Wood	0.03194	0.01597	140,544	70,272
Fiberboard	0.00045	0.00023	1,998	999
Plywood	0.02519	0.01385	110,814	60,948
Veneer	0.00075	0.00041	3,286	1,807
Pulp	0.02370	0.00592	104,272	26,068
Paper	0.04334	0.01084	190,706	47,677
Total	0.12537	0.04722	551,620	207,771

The estimate of the annual consumption of solid wood products (sawn wood, fiberboard, plywood and veneer) totals 134,026 m3, which is equivalent to approximately 256,642 m3 of roundwood equivalent. The estimates do not include fuelwood for industrial or domestic uses and should be treated with considerable caution because of the high level of uncertainty in the national statistics from which they were derived.

¹⁰ Reports from the UN livelihood group in Aceh suggest that almost all cooking in Aceh province uses kerosene and gas rather than wood.

Wood production potential in Aceh Province

Aceh has significant forestry resources. As at 1998, forestry statistics stated that there were 4,130,000 hectares of government-managed forestlands in Aceh Province¹¹, including 1,718,200 hectares allocated as non-production forest, 1,546,000 hectares was allocated to permanent production forests¹², and 847,800 hectares allocated for conversion to other land uses such as agriculture. The areas of forest by type and production status are shown in the table below¹³:

Classification	Description	Area (ha)	Status
Hutan Suaka Alam	National park	1,051,400	Non-production
Hutan Lindung	Reserve forest within production forest estate	666,800	
Hutan Produksi Tetap	Permanent production forest	188,300	Production forest
Hutan Produksi Terbatas	Permanent production forest with limits ¹⁴	1,375,700	
Hutan Produksi Konversi	Production forest to be converted to other land uses	847,800	
Total		4,130,000	

Concession licenses have been issued for most of this production area for sustainable forest management of natural forest, plantation forests and conversion of natural forest to agricultural uses. The areas of forest concession licenses are shown in the table below¹⁵:

Forest License Type	Description	Area (ha)
HPH	License to manage natural forest on a sustainable basis under TPTI guidelines.	788,905
HTI ¹⁶	License to manage plantation forest.	247,265
IPK ¹⁷	License to clear plantation forest for conversion to other uses.	3,764

¹¹ Since 1998 there have been considerable changes to the administration of forestry lands. The consultant understands that the general land use allocation remains similar to that in 1998 but does not have any documentation to support this assumption.

¹² Permanent production forest includes natural and plantation forests.

¹³ Syah Kuala University (2001)

¹⁴ Hutan Produksi Terbatas usually refers to forest on steep land where production is controlled, e.g. limits on minimum tree diameter sizes and volume extracted per hectare.

¹⁵ Detailed lists of HPH (natural forest), IPHHK (conversion forest) and HTI (plantation forest) licensee companies in Aceh and North Sumatra are recorded in Appendix 2.

¹⁶ The HTI area refers to the land area and not actual planted area. Informal sources suggest that less than one half of the HTI license area has been planted.

¹⁷ IPK licenses are issued for a one-year term.

Actual wood production and processing capacity in Aceh Province

Wood Supply: While there are significant forestry resources in Aceh, currently there is only a relatively small volume of legal harvesting being conducted in the Province. There are several reasons for this:

- In 2001, the Governor of Aceh Province declared a moratorium on all logging in HPH forests. The stated reasons for declaring the moratorium were concerns about security and illegal logging activities.
- Security concerns have also halted logging and forest management activities in HTI forest plantations.
- Security concerns have disrupted logging and forest management activities in IPK - forest conversion areas. According to the Dinas Kehutanan (Provincial Forestry Department), actual IPK harvest volumes are approximately 50,000 m³/year out of allowable cut of 90,000 m³/year because production is constrained by security problems.

The only legal harvesting at this time is being conducted in IPK forests¹⁸. The distribution of licenses by District is described in the table below.

District – Kabupaten	License Volume (m ³)	License Area (ha)
Aceh Besar	10,112	450
Aceh Jaya	3,050	100
Aceh Singkil	2,544	100
Aceh Tamiang	14,339	600
Aceh Tenggara	22,592	1,000
Aceh Tengah	4,283	200
Aceh Timur	8,546	400
Bener Miriah	10,484	200
Bireuen	3,967	200
Nagan Raya	2,246	100
Pidie	1,842	100
Simeulue	6,962	314
Total	90,967	3,764

While the 2005 estimated cut from IPK is 91,000m³, it is likely that actual cut volumes will be closer to 50,000 m³ due to difficulties accessing and operating in the licensed areas due to security concerns.

There are almost certainly illegal logging activities occurring in production forest areas. The consultant was not able to ascertain to any degree the extent, scale or location of illegal logging in Aceh.

¹⁸ In Aceh, the Dinas Kehutanan issues IPK. Aceh and Papua are the only Provinces in Indonesia entitled to issue IPK licenses because it has special autonomy status.

Wood Processing Capacity: In former times, Aceh was a large producer of sawn timber, mouldings, blockboard and chips. The 1997 economic crisis and security crisis dramatically reduced the volumes being produced legally in the province.

In 2004, the Dinas Kehutanan granted permission to approximately 106 sawmills in Aceh. The total official capacity of these mills is approximately 150,000m³ roundwood per year. In addition, the region has two large plywood mills and one pulp mill that are currently not operating. There would appear to be a surfeit of capacity if logs were available.

Alternative wood supplies in Aceh Province

There are at least three main alternative sources of wood supply other than production forests¹⁹:

- **Public forests** that are defined as land planted with various trees, including bamboo, from which timber is the main product. There are 317,444 hectares of public forests in Aceh. Unfortunately the statistics do not differentiate between tree plantations and bamboo groves. Notable species include:
 - *Casuarina equisetifolia*: A native of Indonesia, is cultivated in plantations for erosion control particularly in coastal environments. Casuarina is valued for its nitrogen-fixing qualities as well as for wood. Its wood is used for fuel, building poles, sawn or hewn building timber, wall paneling, shingles, exterior fittings, fences, railway sleepers, tool handles, and boats.
 - *Swietenia macrophylla*: Commonly called mahogany, this species was introduced from South America. This tree is commonly planted around villages, as roadside trees, and in small plantations. The timber is highly sought after and valuable.
 - *Bamboo*: Bamboo is used for a variety of uses including for mats and wall partitions. Its usage is probably more suitable for temporary materials than for permanent structures. It is proposed that bamboo be considered for the construction of house poles.

- **Plantation crops** from which timber is a secondary product. The main types of plantation crops in Aceh with potential to generate wood products are rubber trees and coconut palms.
 - Rubber wood is now highly valued for the manufacture of interior and exterior furniture. There are 37,500 hectares of rubber plantation in Aceh, much of which is over-mature and not well maintained. One opportunity to supplement local wood supply is to clearfell over-mature rubber plantations and replant in rubber wood or some other plantation species. Rubber has significant technical difficulties (sap stain and rot), but can be used for internal purposes and furniture.
 - Coconut wood is also utilized now and valued for furniture production. Coconut stems are also used for pole construction. Processing coconut poses practical difficulties. The conversion rate from coconut logs to sawn timber is relatively low. Furthermore coconut timber has high silica content, is extremely hard and requires special tungsten tipped saw blades.

- **Village garden trees** from which timber is a secondary product. There are a variety of village trees that are utilized for their timber, notably:
 - *Artocarpus heterophyllus*: Commonly called jackfruit or nangka in Indonesia. This fruit tree also produces highly prized timber. The timber is extremely strong, resilient and resistant to terrestrial and marine termites. It is used in furniture and for boat frames.

¹⁹ BPS (2003)

- *Casuarina equisetifolia*, *Swietenia macrophylla* and bamboo are all grown as village garden trees.
- **Tsunami debris** that contains intact and broken trees, logs and processed wood products. According to UNDP field staff, preliminary work indicates up to 60% of urban debris can be salvaged for sawn timber and fuelwood for brick kilning.

It is difficult to determine the volumes of salvage wood but we estimate approximately 75,000m³ of salvageable building materials²⁰ and perhaps a similar volume of coastal trees (roundwood logs suitable for conversion to sawn wood or firewood). We provide the following estimates of the recoverable salvage volumes by product classes²¹:

- 41,250 m³ of sawn wood
 - 15,000 m³ of sawn wood obtained directly from the debris
 - 52,500 m³ of logs from damaged or dead trees for conversion to sawn wood, equivalent to 26,250 m³ sawn timber.
- 82,000 m³ of broken timbers and logs for brick kilning or fuelwood
 - 60,000 m³ of broken timbers
 - 22,500 m³ of logs from damaged or dead trees

There are major issues related to collection, distribution and utilization of tsunami salvage materials.

- Wood products are a perishable item with a shelf life in debris of only a few months. Salvage operations should be an urgent priority to minimize the losses of wood through spoiling.
- Much of the debris is located in rural areas with limited access and infrastructure for collection, distribution and processing. Economic returns from salvaging wood products appear to be marginal, as the current rates of salvage appear to be low. Provision of expertise, some equipment and finance may be required to facilitate salvage operations and maximize salvage volumes.
- Finally, the large volumes of wood available are significantly greater than the immediate ability of available capacity to consume the product. Salvage operations might require temporary storage of materials to regulate the supply into the market.

²⁰ Based 50% salvage of construction timbers from 300,000 houses partially or completely destroyed with average 0.5m³ per house.

²¹ These are estimates only based on brief field inspections. We believe these estimates to be conservative.

Importing timber supplies into Aceh Province

Wood donations: The Ministry of Forestry has sent letters of invitation to various countries and organizations supporting any initiative that would enable timber being imported into Aceh for reconstruction purposes.

Several countries have expressed interest in donating wood. The consultant met with representatives of the New Zealand and Swedish embassies²² as well as forest industry representatives from British Columbia in Canada. There was interest in the concept of procuring wood in the donor countries and importing this timber into Aceh. There were also concerns expressed about:

- The suitability of temperate softwood species for structural uses in tropical climates.
- The technical specifications regarding timber grade, treatment and dimension.
- The mechanism for procuring timber from forest owners at source.
- The logistics systems for delivery, warehousing and distribution of the goods.
- The mechanism for selecting beneficiary organizations and the pricing of goods²³.

In addition, the consultant met with three non-governmental organizations (NGOs) arranging imports for Aceh reconstruction.

- Save the Children Fund has a significant programme aimed at building hospitals, schools and shelter. They have a 3-person team dedicated to domestic and international procurement of timber. They have prepared extensive procurement guidelines to avoid procurement of illegal timbers. The contact for STC is:

Matthew Bright
mbright@savechildren.or.id

- The World Wildlife Fund Indonesia (WWF) is implementing a programme called “Timber for Aceh”. The programme is aimed at facilitating imports of timber into Aceh from foreign donors. At this time, they have opened an offices in Aceh with a local representative and they are seeking partners / donors with whom they can work with.

Mubariq Ahmad
Project Manager, Timber for Aceh.
Taman A, Unit A1
Mega Kuningan, Jakarta
Phone : 576 1070, Fax : 5761080

²² The German Embassy are still considering the matter and were unavailable to discuss the matter.

²³ Goods donated by Governments will not attract duties or sales tax under the EMOP for Indonesia. Goods purchased by organizations and imported as donations will likely not attract duties or sales tax. Goods imported and sold in Indonesia will attract duties or sales tax.

- PT Panca Duta Perkasa is a local Indonesian company specializing in supply of construction materials for Aceh. One line of products they are specializing in is legally produced timber from within Indonesia and from timber imports. The contacts are:

Arian Ardie and Phillip Rickard
 Jl. Jelambar Raya no 11A, Rt 003/007,
 Jakarta 11460.
 Tel 021-56940564 / Fax 021-65940563
aajkt@yahoo.com, rickard@imt.co.id

Customs procedures for importing into Aceh: Simplified procedures were issued by the Ministry of Finance to speed the clearance of goods through customs for the supply of goods for humanitarian relief in Aceh. Subsequently, procedures for importing goods, including timber, have been prepared by UNJLC²⁴. Important points to note are:

- Recommendation letters for importing wood products is required from BAKORNAS and the Ministry of Trade. A copy of these documents should be annexed to the other customs documents.
- All importing agencies are required to complete a PEMBERITAHUAN IMPOR BARANG (PIB - Customs Declaration form).
- Duty and tax free importation for emergency relief purposes in Indonesia is processed using the PAPER 19 form issued by the Sekretariat Negara (Government Secretariat).
- A CERTIFICATE OF AUTHENTICITY that must be signed by the Head of the UN Agency or NGO requesting clearance of the goods should be prepared as this will assist in the speed of clearance.
- Clearance of goods through customs and quarantine requires the following documents:
 - Invoice
 - Packing list
 - Phytosanitary certificate from port of loading
 - An Airway Bill or Bill of Lading (B/L) be used as a substitute for other documents (Manifest, Invoice, and Packing List). However, this is only possible for a temporary period.
- Medan has a permanent customs office. Timber can be imported directly into Banda Aceh, Lhokseumawe, and Simeulue as long as there is a supported port and customs person or office in that place.
- Some countries are black-listed for timber but the consultant was not been able to obtain a list of these countries.

²⁴ See <http://www.unjlc.org>

Technical requirements: There are several technical issues that need to be addressed when considering importing timber:

- It is highly unlikely that any country would import logs into Indonesia for reconstruction purposes. The tasks of transporting and processing logs as well as treating the logs are likely to be too difficult when compared to importing solid wood products.
- The main sources of supply for donated timbers would be from countries located in temperate climates. The species being donated would likely be softwoods that would require treatment so as to be resistant to insect and fungal attacks.
 - Copper Chrome Arsenic (CCA) is not acceptable in Indonesia because of its toxicity, especially when burnt.
 - Copper Chrome Boron (CCB) and is a wet/water borne preservative and an alternative to CCA. It would probably be acceptable for importing into Indonesia.
 - ACQ is copper based preservative in which the Cu is coupled with a quaternary compound (quant) co-biocide for enhanced performance against copper-tolerant fungi and insects. ACQ treated timber requires galvanized nails or stainless steel fastenings to be used, not regular iron nails.
 - Various light organic soluble preservatives (LOSP) treatments are available. One treatment using Permethrin provides fungal and insect resistance.
 - Various Borax treatments would be sufficient for all non-ground contact applications.
- The large majority of construction timbers should to be 75x75/100mm framing / engineering grade or 20x200mm weatherboard.
- Plywood / OSB sheathing should be treated to be water resistant.

Forestry logistics and wood supply infrastructure²⁵

Much of the primary transportation infrastructure and transport in Aceh is in the coastal areas. The tsunami has affected the transport system by damaging roads, bridges, port facilities and vehicles.

- 316 km of the major transport routes in Aceh (19%) were damaged.
- 150 bridges (46%) were destroyed.
- The north-eastern road from Banda Aceh to Lhokseumawe and Medan sustained minor damage but this road is now fully passable.
- The coastal road from Banda Aceh to Meulaboh was severely affected. 30% of its length was completely destroyed along with 60% of the bridges. Four wheel drive / dry weather access is now available to Lamno. But the road is otherwise unavailable for transport of goods.
- A road from Sigli to Meulaboh provides one access route from the northeast coast to the west coast. This road is 80% sealed but takes only small trucks.
- An alternative route from the northeast coast to the west coast goes from Bireun to Meulaboh through Takengon and traverses the mountainous central area. This road is in generally poor condition and passes through the Genung National Park.

Timber Prices

According to a number of merchants and consumers, the average domestic prices for construction timber in Aceh Province ranged between Rp1.6 and Rp2.2 million per cubic meter. Post-tsunami, prices have increased to approximately Rp3.0 million per cubic meter.

The price inflation has been a result of increased domestic demand, lack of local capacity to produce and supply, and difficulties in importing timber from other provinces. The real price inflation is partially disguised because the wood now being produced is of lower quality in terms of species and grade as compared with that available before the tsunami.

The timber price situation is likely to deteriorate when reconstruction starts. The price inflation has occurred in the first 3 months when only temporary building and limited repairs and construction were being done. Consumption of solid wood products is likely increase substantially when the reconstruction programme begins.

²⁵ Consultative Group on Indonesia (2005)

RECONSTRUCTION WOOD DEMAND AND SUPPLY

Overview of Reconstruction Programme

National policy and implementation framework

The reconstruction programme is being implemented through a framework that incorporates central government, provincial government, UN agencies and NGOs:

- In the central government, the effort to develop the reconstruction plan is being led by the Coordinating Ministry of the Economy, known as BAPPENAS. They are responsible for the preparation of the “Blueprint for Reconstruction” an important planning document that describes policies and implementation mechanisms. A detailed programme for reconstruction is to be produced locally in Aceh in April 2005.
- The planning functions at the provincial level are led by the regional office of BAPPENAS known as BAPPEDA. It acts as the main local planning agency and coordinate the activities of other line Ministries. A new organization, BAPEL, is in the process of being created to review, monitor and evaluate the reconstruction process together with donor countries and the relevant UN organizations. It will be the regulating body for the reconstruction process.
- Several line ministries involved in reconstruction have a strong interest in the supply of wood products.
 - The new Ministry of Housing is responsible for planning housing requirements in the reconstruction.
 - The Ministry of Public Works is the implementing agency for housing and infrastructure redevelopment. To date the Ministry of Public Works has organized the construction the temporary housing and road reconstruction programme.
 - The Ministry of Forestry and the Provincial Forestry Department (Dinas Kehutanan) are responsible for wood production.
 - The Ministry of Marine Affairs and Fisheries will require minor volumes of timber for the reconstruction of the provincial fishing fleet. The volumes of timber required may be low, but the importance of the timber supply is critical to this sector, which was dramatically affected by the tsunami.
- The United Nations provides coordinating and operational services through various UN Agencies. Important UN agencies for wood supply related issues include:
 - UN Office for the Coordination of Humanitarian Affairs (OCHA) coordinates the work of humanitarian partners, from UN agencies, funds and programmes; the Red Cross Movement; and NGOs. OCHA facilitates inter-agency decision-making including needs assessments, consolidated appeals, field coordination arrangements and the development of humanitarian policies.
 - The office of the United Nations High Commissioner for Refugees (UNHCR) has been assisting in the area of temporary housing but their involvement in Aceh terminated at the end of March 2005.

- The United Nations Development Programme (UNDP) is involved in heading and coordinating projects to support and strengthen “livelihoods”. This includes programmes for waste salvage and timber usage.
- FAO has three main projects in Aceh. The fisheries programme is supporting rehabilitation of the fisheries sector. The agriculture programme is supporting agricultural rehabilitation. FAO has also commenced work on coastal forest rehabilitation.
- UN Human Settlements Programme (HABITAT) is involved in construction of permanent housing. It is leading a programme to build approximately 10,000 houses on behalf of UNDP. It is also chairing the shelter-working group, a committee of organizations involved in construction of temporary and permanent shelter.
- The UN Joint Logistics Centre (JLC) is an inter-agency logistics co-ordination facility for emergency response established by the Inter-Agency Standing Committee in 2002 under the custodianship of the World Food Programme. The JLC identifies logistics bottlenecks affecting the relief operation, enhances operational planning efforts of individual agencies by assembling and disseminating relevant logistics information and coordinates the use of common humanitarian cargo aircraft.
- The Humanitarian Information Center (HIC) Sumatra is a UN Common Service to the humanitarian community working in Sumatra. HIC Sumatra serves as the information sharing and data exchange platform in order to improve coordination and operational decision-making.
- There are a number of international financing institutions and donor countries’ bilateral and regional aid agencies are supporting reconstruction in Aceh including: the Asian Development Bank, the World Bank, International Monetary Fund, Australia (AUSAID), United States of America (USAID), Denmark (Danida), UK (DFID), ECLAC, European Union (ECHO), Germany (GTZ), and Japan (MOFA).
- Numerous NGOs are working in a wide range of humanitarian activities. Some of these are listed in the section entitled “Timber demand for permanent housing”.

Wood Demand

Reconstruction activities requiring wood products

There are a variety of reconstruction activities requiring wood products. We have identified three reconstruction activities that will require significant volumes of wood²⁶:

- Construction and repair of residential housing and other buildings including schools, medical centers etc.
- Construction and repair of fishing boats
- Brick making

For the purposes of this report, only the needs for the reconstruction programme are considered; calculations do not include demand for wood for construction needs associated with general underlying economic activity.

Wood demand for housing

Requirement for housing: The following assumptions were made to calculate the wood demand for housing reconstruction:

- The total number of displaced people requiring housing is 420,000 persons.
- The displaced people will require the provision of between 90,000 to 110,000 permanent houses.
- Temporary housing is largely provided by Department of Public Works through the provision of 1500 Temporary Location Centers (TLC's) to accommodate 90,000 persons.

Timber demand for temporary housing: The Government has largely completed the construction of the 1500 TLC's. The volume of timber used in the barrack construction programme was approximately 50,000m³. The future timber demand for TLCs will be negligible because the temporary housing project is largely completed.

²⁶ Other uses for wood would be for building schools, health centers, and infrastructure for bridges, wharves, etc. While important, the total volume required for these activities is likely to be small relative to housing construction.

Timber demand for permanent housing: The consultant was unable to obtain building codes, standards, specifications or prescription that apply to Aceh reconstruction. The authorities have decided to adopt an open view of how rebuilding and reconstruction will be implemented with regard to the design of permanent housing.

The “Blueprint for Reconstruction” released in March proposes that the mechanism for construction of housing is to provide households with a set amount, Rp28 million. It will be up to each household to decide the type of construction materials used for the house. The volume of timber used in the permanent housing depends on several factors.

- The total number of houses built. The calculation is based on a prediction that a total of between 90,000 and 110,000 permanent houses to be build, with a best estimate of 100,000.
- House layout. The Government has specified in the “Blueprint for Reconstruction” that the standard house size recommended for reconstruction is to be 6m X 6m with 36m² floor space. The President has publicly supported this recommendation. It is not clear is this recommendation is prescriptive or a guideline.
- Whether timber is being used for partial reconstruction and new dwellings.
- The mix of construction materials used by building groups. Groups are proposing various configurations using between 0% and 100% timber content.
- Consumer preferences. Householders in Indonesia usually prefer brick and concrete construction to wooden houses. This preference is counterbalanced by fact that brick and concrete construction is considerably more expensive than building in timber.

The following timber volumes for a standard 36m² house made completely from wood²⁷ with plywood walls and solid timber frames are estimated as follows:

Roofing Trusses	0.412
Wall frame	0.678
Plywood walls	0.950
Plywood ceiling	0.288
Wooden floor	0.704
Total	3.032

Timber volumes for a standard 36m² house made completely from wood with weatherboard walls and solid timber frames are estimated as follows:

Roofing Trusses	0.412
Wall frame	0.678
Weatherboard walls	1.418
Plywood ceiling	0.288
Wooden floor	0.704
Total²⁸	3.500

²⁷ Note that this is the total volume of solid wood products needed for made almost entirely from wood. The actual average wood usage per house will be less depending on the construction materials used.

Based on 75% timber usage for the average house and a contingency allowance of 20%, the timber demand is estimated to be between 275,000 and 315,000 m³²⁹. The timber content estimates by products are:

Configuration	Sawn timber	Plywood	Total
Plywood walls	162,500	112,500	275,000
Weatherboard walls	289,000	26,000	315,000

The organizations that have informed the consultant/FAO of their intention to fund or directly build transitional and permanent housing are as follows:³⁰.

Organization	Transitional Shelter	Permanent Shelter
Department of Public Works	1,500	????
Save the Children		5,000
United Nations High Commission for Refugees		15,000
Catholic Organization for Relief & Development Aid		1,513
Ananda Marga Universal Relief Team		121
Community Habitat Finance International		???
Mennonite Central Committee		1500
Habitat For Humanity Indonesia		10,000
Mercy Corps (Cash for labour)		
German Technical Cooperation		600
United Nations Development Programme		10,000
Care International		8,500
Yayasan Berkati Indonesia		4500
Asian Disaster Reduction and Response Network		327
Concern		???
Red Cross		10,000
Oxfam		5,000
SOS		300
Lighthouse		250
IOM		3,000
Total	1,500	75,611 ++

²⁸ If the walls were constructed using weatherboards then the total timber content would be

²⁹ There is no Government policy on the preference of using solid wood building materials over brick, concrete, steel or other alternative materials. Therefore, the timber usage of 75% is an educated best estimate only.

³⁰ Organizations will directly fund the large majority of permanent housing required. It will be the responsibility of central Government to address any shortfall in housing funding.

Wood demand for boat building

Requirement for boat building: The consultant used the following assumption in estimating the wood demand for fishing fleet reconstruction:

- The total number of boats destroyed or severally damaged in the tsunami is estimated to be 7000³¹.
- The majority of the boats requiring rebuilding are small 7m craft, approximately 75cm in depth and 1.5m in width.

Timber demand for boat building: Boat building requires timbers with special attributes. All timbers must be dimensionally stable in the marine environment and resistant to fungal and marine borer attack. The hull must be constructed using timbers that are flexible and strong. The frame and keel need to be strong and rigid.

Only a few species are suitable for boat building. A visit to a local boat builder provided the consultant with the following information on species preferences³²:

- Nangka / jackfruit (*Artocarpus heterophyllus*) is a preferred species for the boat frame.
- Cemara (*Casuarina equisetifolia*) is a preferred species for the keel.
- Bankerai / yellow balau, mane, sumawe and bayu are preferred species for the hull³³.

The general timber dimensions are described below:

- The hull timbers are 250–300mm by 20mm boards in long lengths.
- The frame is constructed using 75-100mm by 75mm boards.
- The keel uses large dimension timbers of approximately 100mm by 100mm.

The average timber content per boat is estimated to be 1m³. The total volume of wood required to rebuild the fishing fleet is likely to be between 7000 to 10,000m³.

Timber procurement for boat building: The rebuilding of the fishing fleet is a unique case of wood procurement. There are strong technical and social preferences for using locally grown species. We believe that the volumes required for boat building will be difficult to source locally because only a small proportion of the timber harvested locally will meet the species, grade, and dimension requirements. While the volumes required are relatively small, the resultant rebuilding of the fleet will have profound impact on the fishing industry.

There is a real case for proactive intervention on the part of FAO to assist small-scale boat building businesses to source and procure timbers from within Aceh and in other Provinces in Sumatra.

³¹ Personal comment from Alexander Jones, FAO Aceh Relief Coordinator

³² Other boat builders may be able to identify suitable species in addition to those in this list.

³³ These species are identified by their local name only as we are uncertain about their botanical species name. Naming conventions for species in Indonesia are notoriously imprecise and can vary between province and district.

Wood demand for manufacture of bricks

Brick manufacturing is a significant business in Aceh. Brick is a preferred building material in Aceh and the material of choice for commercial buildings and for higher priced residential housing. The large majority of inexpensive housing in the urban and rural settings is constructed using timber.

The large majority of bricks are locally produced in small wood-fired kilns. A typical brick works produces approximately 10,000 bricks per week, enough to build one home. It requires approximately 9 m³ of wood to fire this number of bricks. Therefore, roughly twice as much wood is needed to fire the bricks for a brick house than to build a wooden house.

The consultant was not able to obtain any official information on the number of brick works or the annual production of bricks. Unofficial reports³⁴ suggest that one firewood supply area alone produces 1200 log trucks worth of wood every month for firewood kilning, equivalent to 4000 m³ per month or 48,000m³ per year.

For the purposes of this study, the assumption was made that approximately 10,000 houses are constructed each year, for which the manufacture of bricks uses approximately 90,000 m³ of firewood. It is further assumed that an additional 10,000 brick houses will be built as part of reconstruction programme, requiring an additional 90,000 m³ of firewood. There is the possibility of salvaging large volumes of bricks from damaged buildings to supplement supply.

Summary of wood demand for reconstruction

The solid wood volumes required for reconstruction are estimated to be as follows:

Usage	Sawn timber (m ³)	Plywood (m ³)	Fuelwood (m ³)	Total (m ³)
Wooden houses	289,000	26,000		315,000
Boat building	10,000			10,000
Bricks			90,000	90,000
Total	299,000	26,000	90,000	415,000

³⁴ Miklos Platthy, mplatthy@planet-save.com.

Wood Supply / Demand Balance

The wood supply demand balance is shown in the table below:

Demand Summary		
Details	Volume (m3)	RWE (m3)
Solid wood products for reconstruction (buildings, boats)	325,000	650,000
Firewood used for kilning bricks used in reconstruction	90,000	90,000
Total Supply	415,000	740,000
Supply Summary		
IPK conversion forests, 2 years production over reconstruction period		100,000
Supply Demand Balance		
Demand – Supply		640,000

Clearly there is a large deficit between supply and demand in the Aceh region. The deficit is even greater when you consider that there is an additional demand of 134,000m³ for solid wood products and 90,000 m³ for firewood to meet the underlying annual demand in Aceh province.

The increase in wood demand and resultant supply deficit following the tsunami has significant economic and environmental consequences.

- Prices have already increased considerably. Currently prices are approximately double the pre-tsunami levels.
- Price inflation is affecting the whole of the province and is having significant negative economic impacts.
- The province has limited ability to increase the supply of wood from production forests under the moratorium. The supply deficit creates a demand that will create increased incentive for illegal logging. By its nature illegal logging is uncontrolled, unsustainable and environmentally damaging.

Potential strategies to alleviate the supply deficit include:

- Maximizing the volume of materials obtained through salvage operations.
- Utilizing alternative and suitable supplies of local wood such as dead and dying trees, trees in public forests and gardens, roadside trees, estate crops, and pulpwood plantations.
- Commence legal and environmentally sustainable harvesting in the production forests.
- Minimize the use of timber in construction where economically priced alternatives are available.
- Facilitate the importation of legal and sustainably produced wood products from other provinces in Indonesia and from overseas.

Sourcing and Physical Delivery Constraints

Lack of forest industry capacity

There is currently a lack of capacity in the forest and sector.

- The Dinas Kehutanan lost 49 staff, transport vehicles and offices during the tsunami. They currently do not have the resources to fully support a comprehensive forest management and wood supply programme.
- There is a lack of harvesting machinery, wood processing plants and transport capacity to support local wood production operations. Sumatra has a large forest harvesting and wood processing capacity but they are not located in the areas where they are needed, especially for supporting salvage operations.

Lack of transport infrastructure

The poor quality of the transport infrastructure creates significant difficulties for the supply of wood products for reconstruction.

- Reconstruction requires the transportation of large volumes of wood products relative to other reconstruction and humanitarian supplies.
- Banda Aceh and Meulaboh are currently supplied from Lhokseumawe and Medan over poor quality roads.
- It is currently virtually impossible to deliver wood products by road to anywhere on the west coast other than to Banda Aceh and Meulaboh.
- Conventional coastal shipping has been significantly disrupted. The coastal fishing fleet has been significantly reduced in number by the tsunami. The port facilities in Banda Aceh and the west coast have been largely destroyed. The harbor seabed levels have been radically changed making in-shore navigation difficult. The local roading networks in many areas have been damaged, making distribution of shipments difficult. Redeployment of barges and shipping from other regions should be feasible until roads are repaired.
- There is a lack of port handling facilities such as container handling facilities or warehouse storage facilities. In addition, in many places the local roading systems are not of high enough quality to allow delivery of the goods from the port storage area to the construction site.

The reconstruction logistics problems are not insurmountable, but require a considered and coordinated approach.

- A clear policy and implementation programme needs to be formulated by central and provincial Governments. Currently a draft “Blueprint for Reconstruction” has been prepared and is awaiting confirmation by the President.
- The donor and implementing organizations need to become significantly more organized so that effective supply chain systems can be designed to meet their needs.
- There are very few options for delivery of wood products to and with Aceh until the roading and port facilities network are rebuilt. Wood products can only be delivered to Banda Aceh and Meulaboh by road or barges. Wood products can only be transported to the west coast by barges. Therefore, it should be relatively easy to develop an integrated wood and construction material supply plan for the reconstruction programme.

Illegal timber and procurement difficulties

The reconstruction programme should be undertaken in a manner that complies with the laws and regulations of the Republic of Indonesia. Unfortunately, the production of illegal timber is currently widespread in Indonesia. Furthermore, legal timber is actually difficult to procure, particularly so in Aceh which has very limited stocks of legal timber.

NEEDS

Maximize the recovered volumes and utilization of salvage wood

An immediate priority is to maximize the salvage of wood from the tsunami rubble to alleviate wood supply shortages, minimize wastage and loss of wood products, and assist with the clean-up process. Up to 60% of debris is estimated as possible to be salvaged to provide 41,000m³ of sawn wood and 82,000m³ of fuelwood for brick kilning. Currently, only a small proportion of wood appears to be salvaged and the need is to scale up the salvage operations before large volumes of wood perish and become unusable.

FAO could provide support in the following areas:

- Provision of technical advice on wood extraction and processing. This could include:
 - Identification of optimal machine and labor configuration for salvage of logs.
 - Identification of wood processing options for salvage logs, including the requirement and configuration of specialist sawmill equipment verses the use of existing local milling capacity.
 - Advice on the requirement and configuration of logistics systems required for storing and distribution of salvage wood products. This may be a significant factor especially with fuelwood where it is located a long distance from the brick kilns or where the fuelwood volumes need to held in storage and supplied over a extended period of time.
- Implementation and coordination of salvage operations either as a stand-alone project or in support of existing projects such as the UNDP waste recovery project. This work could include:
 - Implementing salvage pilot projects to test alternative approaches and for demonstration and training purposes. At least two pilot projects would be needed because of the different conditions in the urban and rural environments.
 - Facilitating and expediting the bureaucratic processes for obtaining authorization for accessing waste materials and procuring waste products.
 - Sponsoring cash for work programmes for waste wood collection.
 - Providing funding for equipment and services hire or equipment acquisition.

Maximize the use of alternative wood supplies

An immediate priority is to maximize the local supply of wood products from alternative wood sources outside of the natural production forests. Potential alternative sources of wood include public forests, plantation crop trees, roadside trees and village garden trees. If possible, wood salvage operations should be integrated with harvesting of alternative wood supplies and with site rehabilitation operations.

The consultant has not quantified the potential available volumes from alternative wood supplies, but they are believed to be significant. Currently, only a small proportion of this wood is being utilized. FAO could provide support in the following areas:

- Provision of technical advice on the suitability and utility of various potential alternative wood supplies. Factors to consider for each alternative wood supplies are:
 - The availability and accessibility of the wood supply;
 - The utility and suitability of the wood for assisting the reconstruction programme;
 - The ability to utilize the timber using existing extraction and processing infrastructure
 - The requirement for the procurement of specialist equipment and / or services.
- Implementation and coordination of alternative wood supply operations. This work could include:
 - Implementing pilot projects for alternative wood supply to test feasibility and for demonstration and training purposes.
 - Facilitating and expediting the bureaucratic processes for obtaining authorization for accessing alternative wood supplies.
 - Sponsoring of cash for work programmes for harvesting operations.
 - Providing funding for equipment and services hire or equipment acquisition.

Alleviate problems with the supply chain and facilitate delivery of wood supply

There are potentially significant problems in accessing solid wood products for reconstruction especially related to procurement of legal wood and the delivery of wood. Procurement of legal wood is difficult because of the limited supply and delivery is hindered because there has been considerable damage to transportation infrastructure.

FAO could provide support in the following areas:

- Preparation of procurement guidelines and standards for solid wood products. The guidelines could include:
 - Technical standards for solid wood product grades, treatments and dimensions and suitability and usage of various products.
 - Procurement guidelines for purchasing legal timber.
 - Guidelines for the importation and supply of legal timber from overseas.
 - Lists of preferred suppliers.
- Preparation of an integrated wood supply logistics plan for the reconstruction programme. This plan should:
 - Document in detail the main locations where wood needs to be delivered for reconstruction, the volumes to be delivered and the

- infrastructure available to support the supply of these solid wood products.
- Describe the main options for delivery of wood to each location³⁵. In particular the preferred mode of delivery should be identified and the additional infrastructure and equipment needed at each location.
- Coordination and perhaps implementation of wood supply operations. This work could include:
 - Work with the government to provide clear policy as to wood usage and procurement.
 - Work with timber buyers to provide information on wood availability and standards for wood usage, to provide guidelines and technical support for procurement, and to coordinate and facilitate wood supply.
 - If requested, provide technical support to countries wishing to donate solid wood products for the Aceh reconstruction programme.
 - A special case can be made for FAO to be actively involved in procurement of boat building timbers to assist reconstruction of the Aceh fishing fleet. Boat building requires small but significant volumes of specialist timbers that realistically can only be sourced in Sumatra. It is not really feasible to supply the demand from Aceh alone in the short term, but could be procured from various locations around Sumatra.

Alleviate negative environmental and social externalities from tsunami damage and reconstruction programme

Specific coastal forestry rehabilitation programmes are outside of the scope of this report. Nonetheless, it should be stressed that all wood salvage, wood supply, and delivery operations should be carried out in such a way as to minimize negative environmental impacts, and, if appropriate, be carried out in conjunction with remedial rehabilitation programmes.

Support and assist planning and implementation capacity in the Dinas Kehutanan

The Dinas Kehutanan (Provisional Forestry Department) was critically weakened by the tsunami through losses of vehicles, buildings and most importantly key staff members. In meetings with FAO, the Dinas expressed a desire to lead coastal forest rehabilitation programmes, implement revised forest management plans for the province and commence sustainable logging of the Province's natural and plantation forests. At the same time they acknowledge constraints placed on them through lack of equipment, facilities and skills.

³⁵ We believe that there are actually very few practical options for delivery of wood products to most locations in Aceh.

We believe that FAO could provide support in the following areas:

- Assistance with a province-wide inventory of forests and trees in Aceh. The inventory could utilize satellite photography currently being collected to assist in the Aceh reconstruction programme. The remote sensing information could be supplemented by a ground-based forest and ecological inventory at sample sites. An updated forest inventory should be considered as an essential pre-requisite for any long-term planning exercise.
- Assistance with preparation of a revised regional forest management plan. The management plan would look at issues relating to:
 - Forest land-use allocation for the purposes of protection, conservation, forest production and conversion to alternative land uses.
 - Forest production planning and license allocation
 - Wood transportation, processing and utilization planning
- Assistance in terms of resources and equipment, especially where they can support planning and operational control activities. The types of resources and equipment that the FAO could provide include:
 - Computer hardware and software to support forest management planning to support remote sensing and mapping activities.
 - Field inventory equipment and transportation.
 - Training and capacity building
- Technical assistance in the areas of forest monitoring, chain of custody and control of illegal logging.

PROPOSED ACTIVITIES

1. TA for maximizing utilization of salvage wood and alternative wood supplies

Objective

Implement a technical assistance programme to facilitate the collection and usage of salvage wood materials and alternative wood sources to supplement solid wood product supplies for the tsunami reconstruction.

Inputs

2 weeks work for one forest industry expert and one local consultant to:

1. Investigate the suitability and utility of various potential alternative wood supplies. Specifically investigate the availability and accessibility of salvage timbers and alternative wood supplies and their utility and suitability for assisting in the reconstruction programme;
2. Identification of machine and labor configuration options for collection of salvage materials and alternative wood supplies in urban and rural settings.
3. Identification of wood processing options for salvage logs and alternative wood supplies including the requirement and configuration of specialist sawmill equipment versus the use of existing local milling capacity.

2 weeks work for one forest industry expert and one local consultant:

1. Implementation of pilot projects for wood salvage and processing of alternative sources of wood using local equipment and services for feasibility testing and demonstration and training purposes.
2. Hiring of logging equipment and services - two logging machines and logging crews suitable for working in the urban and rural settings.
3. Hiring of sawmilling facilities and services – use of mills in the pilot project locations and perhaps purchase of specialist sawing equipment as identified by the forest industry expert.

2 months work for one forest industry expert and two local consultants:

1. Scale up of pilot salvage and alternative species processing pilot operations.
2. Facilitation of a programme for salvage logging and utilization of alternative species through the Dinas Kehutanan and Kabupaten.
3. Coordination of wood production programmes with rehabilitation programmes for coastal forests, village trees and community forests.

Outputs

1. Report on the suitability and utility of various potential alternative wood supplies recommending strategies for maximization of salvage and usage of alternative wood supply and proposing production targets for salvage and alternative wood supply.
2. Implementation of robust salvage and wood processing operations measured against production targets.
3. Strengthening of wood processing sectors and government departments.

2. TA to establish robust wood procurement framework and guidelines

Inputs

2 weeks work for one forest industry expert:

1. Preparation of procurement guidelines and standards for solid wood products. The guidelines would include:
 - Technical standards solid wood product grades, treatments and dimensions and suitability and usage of various products.
 - Procurement guidelines for purchasing legal timber.
 - Guidelines for the importation and supply of legal timber from overseas.
 - Lists of preferred suppliers.

Outputs

1. Procurement guidelines and standards for solid wood products.
2. Lists of vetted and approved suppliers.

TA for the preparation of, and support for, an integrated wood supply logistics plan

Inputs

1 months work for one forest logistics expert:

1. Preparation of an integrated wood supply logistics plan for the reconstruction programme for overall wood supply and delivery.
2. Preparation of a wood logistics plan for the main locations where wood needs to be delivered for reconstruction, the volumes to be delivered, the infrastructure available to support the supply of these solid wood products, the preferred mode of delivery and the additional infrastructure and equipment needed at each location.

Full time forest logistics officer:

1. Assist in coordination and in collection and dissemination of information to assist with the work of the many actors - NGOs, donors, local and national government, etc, providing detailed town-by-town data on:
 - What is needed (products, volumes, specifications)
 - Who is doing what (NGOs, government, active projects, contacts, needs for materials)
 - How to get wood here (local supplies, transport routes, contacts, contractors)

Outputs

1. Wood logistics plan for the region and for the main supply and delivery locations.
2. A workshop to disseminate procurement guidelines to stakeholders.

TA for assisting the preparation of a revised regional forest management plan

Inputs

1 forestry-planning expert for 1 – 2 years to work in association with Dinas Kehutanan

1. Planning and implementation of inventory of provincial forests and trees in Aceh to include remote sensing survey of forest resources, ground based forest survey and ecological inventory.
2. Preparation of revised regional forest management plan covering land-use allocation, forest production planning / license allocation, and wood transportation, processing and utilization.
3. Provision of resources and equipment to support planning and operational control activities.
4. Technical assistance in the areas of forest monitoring, chain of custody and control of illegal logging.

Outputs

1. Revised forest resource information / forest description.
2. Revised regional forest management and wood processing development plans.
3. Increased capacity within Dinas Kehutanan in the area of planning, production monitoring and control.
4. An adequately resourced and equipped planning and management department within Dinas Kehutanan.

APPENDIX 1: FORESTRY COMPANIES IN ACEH AND NORTH SUMATRA

A list of HPH (natural forest), IPHHK (conversion forest) and HTI (plantation forest) companies have been provided by Asosiasi Pengusaha Hutan Indonesia (APHI). Company details are shown below:

List of HPH Concessionaires in Aceh Province		
Company	Group	Area (ha)
PT. Aceh Inti Timber Co. Ltd		80,804
PT. Alasaceh Perkasa Timber	Murjur Timber	56,500
PT. RGM Lestari d/h PT. Bayben W	Raja Garuda Mas	96,500
PT. Kruing Sakti	Kayu Lapis Indonesia	115,000
PT. Lamuri Timber	Wiralanao	44,400
PT. Wira Lanao Ltd		55,925
PT. Kopentren Najmussalam		30,846
PT. Trijasa Mas Karyu Inti		41,000
PT. Gruti		118,000
PT. APPI		45,990
PT. Medan Remaja Timber		39,300
PT. Hargas Industries Ind		64,640
	Total	788,905

List of HTI Concessionaires in Aceh Province		
Company	Group	Area (ha)
PT. Aceh Nusa Indrapuri		110,000
PT. Aceh Swaka Wana Nusa Prima		7,050
PT. Rimba Penyangga Utama		6,150
PT. Rimba Timur Sentosa	Raja Garuda Mas	6,250
PT. Rimba Wawasan Permai		5,200
PT. Tusam Hutani Lestari	Nusantara Energi	97,300
PT. Gunung Medang Utama Raya Timber		7,300
PT. Mandum Payah Tamita		8,015
	Total	247,265

List of HPH Concessionaires in North Sumatra Province		
Company	Group	Area (ha)
PT. Inhutani IV	Inhutani IV	
PT. Inanta Timber	Murjur Timber	40,160
PT. Keang Nam Dev		58,590
PT. Mitra Wana Lestari		50,000
PT. Mulya Jayaco		47,000
Total		195,750

List of HTI Concessionaires in North Sumatra Province		
Company	Group	Area (ha)
PT. Hutan Barumun Perkasa		11,845
PT. PIR Hutani Lestari	Raja Garuda Mas	30,000
PT. Toba Pulp Lestari		269,060
PT. Sinar Belantara Indah		6,200
PT. Sumatera Silva Lestari		42,530
PT. Sumatera Sinar Plywood Industries		
PT Putra Lika Perkasa		
PT. Sari Bumi Bakau		20,100
PT. Sumatera Match Factory		1,500
Total		391,235

List of IPHHK Concessionaires in Aceh Province by Kabupaten		
Company	Volume (m3)	Area (ha)
Aceh Besar		
PT. Putra Graha Bahagia	2,377	100
PT. Eres Leupung	1,955	100
PT. Kutaran Perdana	2,222	100
PT. Makramat Bangsa	2,317	100
PT. Sinar Harapan Kuala	1,241	50
Aceh Jaya		
CV. Jaya Timber	3,050	100
Aceh Singkil		
CV. Aulia Anugrah	2,544	100
Aceh Tamiang		
Ahmad Basyir	1,936	100
Baharuddin	2,329	100
UD. Prima Jaya	2,593	100
Sagiman	2,142	100
CV. Rimba Berlian	2,771	100
CV. Beuna Shikai	2,568	100
Aceh Tenggara		
CV. Mido Karya	2,220	100
CV. Desky Brothers	2,257	100
PT. Putra Utama Agara	2,206	100
CV. Armana	2,353	100
CV. Alas Perdana	2,298	100
CV. Tuah Selian	2,253	100
CV. Bintang Putra	2,428	100
KSU. Putra Selatan Kluet	2,202	100
CV. Sonya	2,199	100
CV. Irwanka	2,176	100
Aceh Tengah		
CV. Cipta Berkat Kreasi	2,169	100
KSU. Serasi Jaya	2,114	100

Aceh Timur		
CV. Krueng	2,404	100
UD. HM. Yusuf Hasan	3,404	100
KLP. Makmur Jaya	1,146	100
CV. Prima Jasa Lestari	1,592	100
Bener Miriah		
CV. Gaybimeg Corporation	5,160	100
Najalian Galuh	5,324	100
Bireuen		
UD. Mitra Collection	1,987	100
UD. Aneka Karya	1,980	100
Nagan Raya		
CV. Intara Kalima Industri	2,246	100
Pidie		
Permuda Pancasila	1,842	100
Simeulue		
PT. Kembang Lima	6,962	314
Total		

APPENDIX 3: SUMMARY OF MEETINGS

March 14, 12.00, Departmen Hutanan (MoF)

Attendants:

Pk Imam Santoso, Kelapa Pusat

Pk Bambang Murdiano, Director, Bureau of International Cooperation and Investment

Location:

Gedung Mangala Wanabakti, Blok 7, 4th floor

Summary:

- MoF is responsible for all forest management issues arising from reconstruction. Actual reconstruction is the responsibility of Department of Public Works.
- The Ministry of Forestry is proposing a soft landing policy with regard Aceh reconstruction. They are looking into temporary increase in the AAC for the country to accommodate an increase harvesting to meet requirements of Aceh reconstruction. This proposal must be submitted to Parliament.
- The Ministry of Forestry will be seeking assistance from other countries for forest rehabilitation and wood supply for reconstruction.
- The Bureau of International Cooperation and Investment has prepared a project to investigate wood supply and demand issues with ITTO under the title “Timber Needs Assessment Project”. The project is to commence in April 2005.
- Pk Imam Santoso has returned from FAO meeting in Bangkok about forest rehabilitation of coastal forests. Pk Imam Santoso will attend a further meeting to discuss proposed action plan to be conducted with FAO in Rome.

Actions:

1. GK has requested details of soft landing policy from Pk Imam Santoso.
2. Pk Bambang has offered to prepare forest production estimates for Aceh and North Sumatera. In particular:
 - Current areas of HPH, IUPHH, IPK.
 - AAC for Aceh and North Sumatera. Summary AAC for whole country.
3. GK to discuss the wood supply and demand issues with ITTO and discuss options for cooperation and information sharing.
4. GK will liaise with Susan Braatz, FAO, about the proceedings of the Bangkok FAO project and subsequent policy initiatives and action plan.

March 14, 13.00, Asosiasi Pengusaha Hutan Indonesia (APHI)

Attendants:

Ir Hendro Prastowo, Executive Director, Asosiasi Pengusaha Hutan Indonesia
Ir Erna Mardiana, Technical and Institutional Relations, Asosiasi Pengusaha Hutan Indonesia

Location:

Gedung Mangala Wanabakti, Blok 4, 5th floor

Summary:

- APHI has provided copies of all HPH and HTI companies in Aceh and North Sumatera along with respective forest areas.
- Pk Hendro estimates that actual log production in is less than 50% of allowable cut. This is mainly due to social and security problems in the province.
- Pk Hendro suggests we consider the opportunity to source logs and sawn timber from HTI. There is reportedly 230,000 and 390,000 hectares of forest plantations in Aceh and North Sumatera respectively. He believes that this is potentially a large source of industrial wood for reconstruction in Aceh. However, he believes that assistance is needed to promote the coordinate supply, improve wood processing technology and develop markets to make the industry sustainable.

Actions:

1. Ibu Erna to email softcopy of the HPH and HTI companies to GK.
2. FAO must contact the HPH and HTI companies directly to obtain actual allow cut and production figures.
3. GK to contact ISWA to obtain list of sawmills in Aceh and North Sumatera. The head of ISWA is Ibu Suwarni and her secretary is Ibu Adi.

***March 15, 08.30, United Nations Environment Programme
(UNEP)***

Attendants:

Andrew Jones, Consultant – Environmental Assessment

Location:

UN Office Jakarta

Summary:

- UNEP want to conduct a remote sensing project for two major ecosystems in Aceh. The purpose is to monitor forest disturbance and logging activities post tsunami.
- Look into creating a linkage between satellite monitoring and ground truthing work.
- UNEP provided working documents for -
 - UNDP assessment of damage.
 - AusAID assessment of West Aceh Islands
 - UNOCHA situation reports
 - Wetlands International mangrove reports

March 15, 10.00, Department of Public Works (PU)

Attendants:

Ir. Adi Sarwoko Soeronegoro, Advisor to the Minister for Economy and International Cooperation.

Dr A. Hasanudin, Ministry for Peoples Housing

Location:

Ministry of Peoples Housing

Aceh Center / SATGAS P.U. Aceh

Jl Raden Patah I No 1.

Summary:

- The Department of Public Works is responsible for implementing reconstruction for the Government of Indonesia.
- PU has prepared a plan for emergency housing as follows:
 - The Department plans to build 1500 temporary location centers (TLC) for the temporary accommodation of 90-100,000 people.
 - A TLC is designed to house 60 people in 12 separate rooms.
 - The TLC rooms are 4 by 5 meters in size (20 m²).
 - Government owned companies would conduct the construction of the TLC's.
 - Timber procurement will be the responsibility of construction companies. Timber will be sourced from Aceh, North Sumatra, Riau, South Sumatra and Kalimantan.
 - Dr A. Hasanudin provided copies of:
 - 60 day response document
 - Basic design drawings of prototype temporary location center (TLC) barracks
 - The contact for PU in Aceh is Mr. Potok

March 16, 14.00, World Wildlife Fund (WWF)

Attendants:

Fathi Hanif, Policy and Legal Officer

Ghislaine Llewellyn, Asia Pacific Marine Project

Location:

Kantor Taman A9, Unit A-1

Kawasan Mega Kunining

Summary:

- Greenpeace collaborated in the preparation of the Greenomics International report-
 - A Preliminary Assessment of Timber Requirements for Aceh's Reconstruction, and Its Implications
- Greenomics International has prepared a second follow up report:
 - Preplanning for timber imports into Aceh
- The main policy aim of WWF is the establishment of a taskforce looking into issues relating to timber supply into Aceh. Taskforce to look into specific wood procurement issues for reconstruction. It is proposed that this taskforce is headed by BAPPENAS.
- WWF wants to ensure that any harvesting in Aceh is within sustainability criteria.
- WWF is concerned that specific issues relating to wood supply for boat building are addressed in addition to global supply issues.
- WWF have offered to provide copies of correspondence on this issue including letters from MoF to WWF supporting the exclusive use of timber from sustainable sources for the reconstruction of Aceh.

Actions:

1. Gk requests a copy of the draft report "A Preliminary Assessment of Timber Requirements for Aceh's Reconstruction, and Its Implications".
2. Gk requests from WWF a statement of their positions and ideas relating to wood procurement in Aceh.
3. WWF propose to meet again in Jakarta on my return to discuss issues in more detail.

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