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A Preliminary Assessment of Timber Requirements  
for Aceh's Reconstruction, and Its Implications

**January 2005**

## **Executive Summary**

This study assesses the volume of logs required to provide temporary barrack accommodation, low cost permanent housing, reconstruction and repair of office buildings, schools, hospitals and houses of worship, as well as for rebuilding the fishing fleet of 3,000 boats during the Phases of Emergency Response and subsequent Reconstruction of Nanggroe Aceh Darussalam. Depending on the timber content of permanent houses the volume of logs required ranges from around 4 to a maximum of 8 million cubic meters. A survey of some potential domestic timber sources (stolen, found, seized, and donated timber, as well as from timber plantations, community owned forests and crop plantations) shows that these are very limited and inadequate.

Fifty thousand m<sup>3</sup> of timber from Aceh's own production forests is legally available immediately. This timber was permitted to be logged in 2004 but was never harvested. However, this volume would only be sufficient to allow the building of 1,000 temporary barracks or rebuilding of Aceh's fishing fleet.

The use of imported, sustainably produced timber is instead recommended in order to avoid the opportunistic practices that could occur, should traders of illegal timber use the "attractive" opportunities that will surely be provided by the great reconstruction need.

This imported timber could be supplied free as in-kind assistance by donor states, with its value being deducted from the total aid commitment made, or by global corporations involved in the trade of such timber. The Indonesian Government should expedite the import process for this timber by ensuring there are no barriers that would delay this and by providing special facilities to ensure it. The Government is advised to use local and international NGOs within existing forestry networks to assist it in lobbying and in the necessary technical preparations, e.g. directing the flow of donated timber.

## I. Foreword

This study is the result of a preliminary assessment of the estimated requirement for timber and of the sources available to meet this need in the Phases of Emergency Response and subsequent Reconstruction of Nanggroe Aceh Darussalam (NAD), or Aceh. The study may be used as a basis for analysis by the government, international institutions, or other relevant parties in planning the uses and supplies of timber needed during these two phases.

The initial evaluation methodology adopted in this study follows the building reconstruction guidelines issued by the government. Consultations on technical aspects of the estimate of the need for timber for building reconstruction were held with the State Housing Company, Ministry of Public Works, and the Office of the State Minister for Public Housing. In turn, for the estimation of the requirements for the fishing fleet, field survey data was obtained from the Ministry of Maritime Affairs and Fisheries, and further consultations were also held with the Fisheries Service of Aceh Province. As well, consultations on technical areas were held with Ministry of Forestry personnel on the analysis of the requirement for timber and the sources available to meet this.

This study discusses the demand for timber for the Phases of Emergency Response in Aceh and the province's Reconstruction, covering: (a) construction of barracks accommodation, (b) construction of low cost, healthy housing, (c) construction of office buildings, hospitals, schools, and houses of worship, and (d) rebuilding the fishing fleet. In exploring the available sources for providing the needed timber, this study explains several alternatives and the associated challenges that include: (a) making use of timber that is found (ownerless), seized, and donated, (b) the use of timber from Aceh's own production forests, (c) the use of timber from plantation forests, (d) the use of timber from community owned forests and from plantation rejuvenation, and (e) sources of imported timber.

## II. Timber Required

### 2.1. Construction of Accommodation Barracks in the Emergency Response Phase

Before constructing housing in Aceh Province, during the Emergency Response Phase the Government plans to build up to 1,000 temporary accommodation barracks for evacuees. The construction of one such accommodation barrack needs around 12.5 to 15 m<sup>3</sup> of sawn timber. Hence, to build 1,000 barracks will need around 12,500 to 15,000 m<sup>3</sup> of sawn timber. Or, taking the assumption of a recovery rate of 40%, it will require *between 31,250 to 37,500 m<sup>3</sup> of logs*. Each barrack is designed to accommodate 50 evacuees, so 1,000 will hold 50,000.

This figure is still relatively low compared to the total number of evacuees, which is over 500,000 people (data as of 11 January 2005). To accommodate them all, at

least 10,000 such barracks would be needed while they wait for the supply of government housing to be completed. Accordingly, it is estimated the total requirement for wood to build the 10,000 barracks would be 125,000 to 150,000 m<sup>3</sup> of sawn timber. With a 40% recovery rate, it is then estimated this would require *between 312,500 to 375,000 m<sup>3</sup> of logs*.

## **2.2. Construction of Low Cost, Healthy Housing (Rs-S)<sup>1</sup>**

The timber required to build an Rs-S house with an area of 36 m<sup>2</sup> (Rs-S2) may be divided according to three technical specifications: (1) On-Ground Wooden House, (2) Raised Wooden House, and (3) Concrete House with Brick/Volcanic ash Brick Walls. These three technical specifications require different volumes of timber for each type of house, with consequent differences in the calculation of the different timber requirements. The calculation is based on the government's plan to build 500,000 family houses (data as of 18 January 2005). The timber needed under the three technical specifications above is as follows:

### ***a. Wooden Houses on Ground***

The construction of an Rs-S2 type, 36 m<sup>2</sup> built area wooden house built on ground, is estimated to require approximately 5-6 m<sup>3</sup> of sawn timber. So, if 500,000 Rs-S2 houses are to be built, this will need 2.5 to 3 million m<sup>3</sup> of sawn timber. Given a 40% recovery rate, it is then estimated this would require *between 6.25 to 7.5 million m<sup>3</sup> of logs*.

### ***b. A Combination of Raised Wooden Houses and Non-raised Wooden Houses***

The construction of an Rs-S2 raised wooden house of 36 m<sup>2</sup> built area requires more timber than for a non-raised one. Each such raised wooden house will need between 9 to 10 m<sup>3</sup> of sawn timber. If the government does opt to build raised houses, naturally not all of the 500,000 homes to be built will be of that type. If its choice is to build 100,000 raised homes and 400,000 non-raised homes, then it is estimated the sawn timber needed will be from 2 to 2.4 million m<sup>3</sup> for raised houses with an additional 0.9 to 1 million m<sup>3</sup> of sawn timber for the raised ones. Hence, the total sawn timber requirement for housing would range between 2.9 to 3.4 million m<sup>3</sup>. Given a recovery rate of 40%, it is then estimated this would require *between 7.25 to 8.5 million m<sup>3</sup> of logs*.

### ***c. Concrete Houses (Brick/Volcanic Ash Brick Walls)***

These houses use less timber than the non-raised and raised timber ones. A concrete house with brick/volcanic ash brick walls needs only between 3 to 4 m<sup>3</sup> of sawn timber per home. Building 500,000 houses of this type of construction

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<sup>1</sup> Refer - Decree of the Republic of Indonesia's Minister of Resettlement and Regional Infrastructure No.: 403/KPTS/M/2002 on Technical Guidelines for the Construction of Low Cost, Healthy Housing (Rs-S).

would need between 1.5 to 2 million m<sup>3</sup> of sawn timber. Given a recovery rate of 40%, it is then estimated this would require *between 3.75 to 6 million m<sup>3</sup> of logs*.

### **2.3. The Construction of Offices, Hospitals, Schools, and Houses of Worship**

From the data on building damage compiled from various sources, it is estimated that between 81,675 to 108,540 m<sup>3</sup> of sawn timber will be needed for the reconstruction of concrete-framed offices, hospitals, and houses of worship. Adopting a correction factor of 25%, this requirement for sawn timber is then predicted to be between 101,756 to 135,675 m<sup>3</sup>. Hence, given a recovery rate of 40%, it is then estimated this would require *between 254,301 to 339,188 m<sup>3</sup> of logs*.

### **2.4. Rebuilding the Fishing Fleet**

The requirement for timber to rebuild and repair the fishing fleet--including un-motorized boats (PTM), those with outboard motors (MT), and inboard motor boats (KM)--is estimated at between 14,774 to 18,468 m<sup>3</sup> of sawn timber (with an assumed 25% correction factor). Accordingly, given a recovery rate of 40%, it is then estimated this would require *between 36,936 to 46,170 m<sup>3</sup> of logs*.

### **2.5. Recapitulation of Timber Required**

From the above calculations of the timber needed for construction of accommodation barracks, housing, office buildings, schools, hospitals, and houses of worship, together with the fishing fleet, the required timber may then be summarized as below:

**Table 1. Recapitulation of Timber Required**

No.	Construction	Number (Units)	Volume of Timber Needed (m <sup>3</sup> )			
			Sawn Timber		Logs needed to produce sawn timber	
			Minimum	Maximum	Minimum	Maximum
1	Accommodation Barracks					
	a. Government’s Plan during the Emergency Response Phase	1,000	12,500	15,000	31,250	37,500
	b. Proposal for the number of barracks for appropriate temporary housing for > 500,000 evacuees	10,000	125,000	150,000	312,500	375,000
2	Low-cost Healthy Housing (500,000 units of 36 m <sup>2</sup> type)					
	a. Option of on-ground wooden houses	500,000	2,500,000	3,000,000	6,250,000	7,500,000
	b. Combination option (100,000 raised wooden houses and 400,000 on-ground wooden ones)	500,000	2,900,000	3,400,000	7,250,000	8,500,000
	c. Concrete Housing Option	500,000	1,500,000	2,000,000	3,750,000	6,000,000
3	Office buildings, Hospitals, Schools, and Houses of Worship	6,098	101,756	135,675	254,301	339,188
4	Fishing fleet	3,000	14,774	18,468	36,936	46,170
	<b>Total Timber Required, OPTION 1: houses with lower timber content</b>		<b>1,629,030</b>	<b>2,169,143</b>	<b>4,072,487</b>	<b>6,422,858</b>
	<b>Total Timber Required, OPTION 2: houses with higher timber content</b>		<b>2,629,030</b>	<b>3,169,143</b>	<b>6,572,487</b>	<b>7,922,858</b>
<b>Explanation:</b>						
<ul style="list-style-type: none"> <li>The total requirement for timber under OPTION 1 [1a + 2c + 3 + 4] covers: (a) 1,000 Accommodation Barracks during the Emergency Response Phase, (b) 500,000 low-cost concrete-framed houses (c) 6,098 Office buildings, hospitals, schools, houses of worship, and (d) A fishing fleet of 3,000 boats.</li> <li>The total requirement for timber under OPTION 2 [1a + 2a + 3 + 4] covers: (a) 1,000 Accommodation Barracks during the Emergency Response Phase, (b) 500,000 low-cost on-ground wooden houses (c) 6,098 Office buildings, hospitals, schools, houses of worship, and (d) A fishing fleet of 3,000 boats.</li> </ul>						

From the above recapitulation of the requirement for timber, the required sawn timber for the OPTION 1 is between 1.6 to 2.2 million m<sup>3</sup>. To supply this volume of sawn timber, between 4.1 and 6.4 million m<sup>3</sup> of logs would be needed. Whereas for the OPTION 2, the volume of sawn timber needed is between 2.6 to 3.2 million m<sup>3</sup>--giving a volume of logs of from 6.6 to 7.9 million m<sup>3</sup>. With the assumption that the construction period would be over the next five years, it means that the average sawn timber requirement is between 325,806 and 633,828 m<sup>3</sup> per year, or equivalent to between 814,497 to 1.58 million m<sup>3</sup> of logs.

### III. Meeting the Need for Timber

#### 3.1. Stolen, Found, Seized, and Donated Timber

Ministry of Forestry Data as of 13 January 2005 shows that the recapitulation of timber to be sent to Aceh from that seized and found in 7 other provinces in Sumatra totals 699.2 m<sup>3</sup> of logs and 1,780 m<sup>3</sup> of sawn timber. In addition, 950 m<sup>3</sup> of sawn timber and 22,700 sheets of plywood have been donated by the timber industry in the Provinces North Sumatra, Jambi, Lampung and Riau.

In contrast, just during the Emergency Response Phase, between 12,500 to 15,000 m<sup>3</sup> of sawn timber, or 31,250 to 37,500 m<sup>3</sup> of logs would be required to build 1,000 barracks. If 10,000 barracks were to be built to accommodate more than 500,000 evacuees during this Phase, it would require between 125,000 to 150,000 m<sup>3</sup> of sawn timber, or between 312,500 to 375,000 m<sup>3</sup> of logs.

**The comparison of these figures make it obvious that stolen, found, seized and donated domestic timber are unlikely to be significant sources of timber to meet the demand during the Emergency Response Phase.** In addition, it should be pointed out that any timber from seized logs will naturally require time to be processed through the courts before becoming available.

#### 3.2. The Use of Timber from Aceh's Production Forests

Timber from production forests within Aceh Province may be used to meet part of the total requirement for timber for Aceh's reconstruction. In 2003, the legal quota for timber production from the production forests in Aceh was 55,000 m<sup>3</sup>. The data reported by the Ministry of Forestry, however, shows that this quota was not realized as production.<sup>2</sup>

During 2004, the Ministry of Forestry reduced the production quota for the province to 50,000 m<sup>3</sup>, by 5,000 m<sup>3</sup> from that of 2003.<sup>3</sup> This log production quota officially had no plan or realization of annual work plan (RKT). This means that, officially, there was zero production during 2004 again.

From the data above, we conclude that **the unused production quota of 50,000 m<sup>3</sup> of logs from Aceh's production forests in 2004 could be used as a quickly available raw material source to supply some of the timber required during the two Phases.** For example, we estimate that between 31,250 to 37,500 m<sup>3</sup> of logs would be required to construct 1,000 accommodation barracks during the

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<sup>2</sup> This lack of any report on production realized is assumed based on the lack of any plan and RKT realization being reported to the Ministry of Forestry.

<sup>3</sup> This 50,000 m<sup>3</sup> quota was already included in the 2004 national 'unused quota remnant' of 4.66 million m<sup>3</sup>.

Emergency Response Phase and that between 36,936 to 46,170 m<sup>3</sup> of logs would be required to reconstruct the fishing fleet (see Table 1).

### 3.3. The use of Timber from Timber Plantations

The total timber demand by the Indonesian wood processing industry is much higher than the timber available from natural forests and plantations. Even the large scale wood processing industry that is operating its own plantation forests is using timber from natural forests. This is based on the quota of timber production issued by the Ministry of Forestry as well as Other Legal Permits/ILS, and the 100-hectare HPHs issued by regency local governments.<sup>4</sup> So, **the supply of timber from plantation forests for Aceh's reconstruction is predicted to be insignificant.**

The Government Regulation on Forest Management states that legal forest product utilization permit (IUPHHKs) for plantation forests may only be granted in forested areas that are empty land, covered in shrub, or are not productive. **Clearing land for plantations does not generate any timber that can be used in this emergency. By law, such lands cannot have any usable timber stands.**

### 3.4. Use of Timber from Community Owned Forests and Crop Plantations

The timber from community owned forests is one of the sources of raw material for the Indonesian wood processing industry. However, the amount supplied from this source is very low. For instance, according to the statistics of timber supply document (RPBBI) for Sumatra in 2003 and 2004, the percentage of the total raw material demand by the industry which was supplied by the community owned forests on the island was only 0.46% and 1.79%, respectively. **Community Owned Forests will not be significant as a source of raw material for the reconstruction of Aceh.**

Apart from being a supplier for the continually increasing need for industrial raw material, timber from community owned forests is also used to meet local people's needs. Nevertheless, it should be noted that the potential for timber from community owned forests has still not been properly and accurately recorded. So, promoting the use of timber from community owned forests as a supply of raw material that could be mobilized during the Emergency Response and Reconstruction Phase would not be a fruitful exercise.

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<sup>4</sup> Since PP No. 34/2002 was issued (June 2002), ILS and 100-hectare HPHs have been considered to be illegal, apart from those previously issued, and then only until their term of validity expires. Nevertheless, many new ILS and 100-hectare HPHs permits can still be found in statistics of timber supply document (RPBBI) for 2003-2004.

In turn, the supply of raw material from the rejuvenation process of the crop plantations, such as old oil palm, coconut or rubber trees, is another source of raw material for industry. From the RPBBI for Sumatra, the contribution of raw material sourced from crop plantations in meeting industry's total needs for 2003 and 2004 were only 0.12% and 1.16%, respectively. These contributions are even smaller than that from community owned forests to the total industry need on the island of Sumatra.

In any effort favoring the use of timber originating from crop plantations to help in the Phases of Emergency Response and Reconstruction of Aceh, we are naturally confronted with the scheduling of the plantation rejuvenation itself and the resulting low level of timber production. In other words, **the supply of timber from rejuvenation of plantations ought not to be taken into account in assisting Aceh, it is considered to be insignificant.**

#### **IV. Recommendations for the Use of Imported Timber**

- a. The use of imported timber is one strategic option for meeting the immediate timber needs for Aceh's Reconstruction Phase. Strategically placed imported timber would help avoid the opportunistic practices of traders of illegal timber who are likely to exploit the opportunities the great re-construction needs in Aceh will provide.
- b. Imports of timber should be negotiated between Government and donor states so the imported timber can be made available free of charge. Timber imports would ideally be included as line items in the existing or new financial aid commitments (pledges) to Indonesia made by governments, corporations or foundations.
- c. Government needs to issue a Presidential Decree to form a Special Task Force to fast and efficiently generate and process timber import. The Task Force could consist of representatives from government bodies and non-government institutions, their main tasks would be lobbying at international level and coordination with global timber networks to ensure a flow of sustainably produced timber to Aceh.