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## **WOOD PRODUCTS IN ERITREA**

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*This paper has been minimally edited for clarity and style*

## 1. Country profile

Eritrea is located in the north-eastern part of Africa and covers an area of 124,320 km<sup>2</sup>. It is bounded by the Sudan in the west and north-west, Ethiopia in the south, Djibouti in the south-east, and the Red Sea in the east (FAO/ Sectoral review, 1994). Administratively, Eritrea is divided into six zones (*zoba*) namely: Makel, Debub, Gash-Barka, Anseba, Semenawi Keih Bahri, and Debubawi Keih Bahri.

The country is divided into six agro-ecological zones. These are: the Central Highland Zone (CHZ), situated at altitudes over 1,500 m with over 500 mm of rainfall; the Western Escarpment Zone (WEZ), situated at altitudes between 750 and 1,500 m with annual rainfall between 400 and 600 mm; the South Western Lowland Zone (SWLZ), situated at altitudes between 600 and 750 m, with annual rainfall between 500 and 700 mm; the Green Belt Zone (GBZ), located between 750 to over 2000 m, with rainfall from 700 to more than 1000 mm; the Coastal Plain Zone (CPL), from below sea level to 600 m, with less than 200 mm rainfall; and the North-Western Lowland Zone (NWLZ), with an altitude from 400 to 1,500 m, and up to 300 mm of rainfall.

Due to its geographical setting, Eritrea has diverse climates ranging from hot arid, adjacent to the Red Sea to temperate sub-humid in isolated micro-catchments within the eastern escarpment of the Highlands. About 72% of Eritrea is classified as very hot, with mean annual temperature exceeding 24°C, while not more than 14% is classified as mild or cool with mean annual temperature below 21.5°C (FAO, 1996). Most parts of the country receive rainfall from the south-west Monsoon, from April to September. Some rain falls in April/May while the main rain starts in June, with the heaviest precipitation in July and August. Only the coastal plains and the central part of the eastern escarpment of the central highland have winter rainfall, November through March, that is borne by north and south-east continental air streams that carry little moisture until affected by the Red Sea. The total annual rainfall tends to increase from north to south, from less than 200 mm at the northern border with the Sudan to more than 700 mm in the south-western part of the country. The Green Belt Zone receives the highest annual rainfall averaging about 900 mm (FAO, 1994).

## 2. Forest Resources

### 2.1. Natural Forest Resources

Three major forest/woodland types are distinguished in Eritrea: highland forests, Acacia woodlands and riverine forests. Originally the highland forests of *Juniperus procera* and *Olea africana* would have extended over much of the plateau, but have been largely destroyed or degraded; only remnants now survive. On the lowlands and lower escarpments, *Acacia* woodlands occupy about a quarter of the surface of the country. Riverine forests fringe river systems of the Gash/ Mereb, Setit and Barka in the Lowlands, where Doom palm is an important constituent. These forests are under the greatest threat as they occupy fertile, well-watered and level sites – suited to development for commercial agriculture. However, they are also vital to the lives of the local population. On the coastal plains tree cover becomes increasingly sparse towards the sea. In places mangroves border the coast, the main species being *Avicennia marina*.

Natural forest cover has been classified according to six major vegetation types following international methodology.

- i) Highland forest, composed of a mixture of coniferous species (*Juniper*) and broad- leafed species (African olive and associated species)
- ii) Mixed woodlands of *Acacia* and associated species, occurring mainly in the Southern part of the western lowlands, but also in restricted areas elsewhere in the country;
- iii) Bush or shrub vegetation, which is the dominant cover in Eritrea;
- iv) Grasslands and wooded grasslands, which occur in many parts of the country;
- v) Riverine forest, composed essentially of Dom palm, which is common in the Western Lowlands and is frequent in the Eastern Lowlands; and
- vi) Mangrove occurring in many places along the coast and concentrated mainly around Assab and between Tio and Massawa.

The natural vegetation of the country constitutes 0.8% highland forest. Forest and woodlands, including riverine forest and mangroves cover 13.5% of the total area. The category “bush” is the dominant vegetation in Eritrea covering 63% of the total area. The riverine forests and mangroves play important ecological and economic roles for rural communities, and occupy 1.5% and less than 0.1%, respectively (Table 1).

**Table 1: Forest/ Woodland Types and Distribution**

<b>Forest Type</b>	<b>Km<sup>2</sup></b>	<b>Share of Total Area</b>
<b>Forest</b>		0.8%
- Closed to medium forest	591	
- Open forest	410	
<b>Woodland</b>		11.3%
- Closed to medium closed woodland	4533	
- Open woodland	9541	
<b>Bush land</b>		63.8%
- Grassland/Wooded Grassland	25,577	
- Bush land	53,824	
<b>Riparian forest</b>		1.6%
- Riverine forest	1,865	
- Mangroves	64	

(Source: Interpretation of Land sat TM by FAO project TCP/ERI/12 (July, 1997)).

## 2.2. Planted Forest Resources

Prior to liberation (before 1991), though few accurate records were maintained, tree planting was concentrated within 6 major catchments (namely, Anseba, Nefhi, Damas, Mereb, Ferendayt and Leghede) as part of a soil and water conservation strategy, based on Food- for-Work. In this way over 10,000 ha of plantation were planted, mainly consisting of *Eucalyptus cladocalyx*, but also *E. globulus*, *E. camaldulensis*, *Acacia saligna*, *A. decurrens*, *A. mearnsii*, etc. Such work was nearly always combined with physical terracing operations. Due to the lack of subsequent maintenance, few of these plantations remain.

In the years leading up to liberation, tree planting by farmers appears rarely to have taken place. Tree planting for amenity by municipalities has obviously taken place in the past, to good effect, but due to the uncertainties prevailing over latter years, existing trees have been damaged, or have died, and there has been little management or replacement.

Following liberation (1992 - 1999) about 69.9 million seedlings have been planted. The main afforestation programme is directed at soil and water conservation and fuel wood production. There has been a major and commendable commitment by the Eritrean Government to continue a programme, which evolved under the Ethiopian regime as an instrument of international food assistance. The old model of Food For Work (FFW) or Cash For Work (CFW) was successful to the extent that it engaged community participation in the short term. Nevertheless, it has no mechanism to engage them beyond that because they are unable to identify with the objectives and outputs, hence the government is assessing the cost-effectiveness of continued investment along these lines.

### **3. Significance of the study**

About a century ago, almost one third of Eritrea's territory was covered with natural forest and extra vast area of acacia woodland. Now the country is left with less than 3% natural forest (highland and riverine forest) and about 1.4 million hectares of degraded acacia woodlands (Table-1). As the forests were deteriorated, tremendous important habitat of the wild life was dwindled and so for the degradation of land fertility due to high rate of soil erosion. The main reason for the aggravation of the process were intensive logging for timber, charcoal making, agricultural expansion, poles and post for traditional house '*Hidmo*' and fire wood and generally unwise land use policy of the successive colonial Governments.

A government legislation banning the cutting of live trees is in effect since 1994, but the compelling demand for this energy source makes it hard to hold as people who are left with virtually no energy alternative in their hands will be forced to continue cutting. The biggest share, for cause of forest distraction, lies with tree cutting for the purpose of fuel wood. Timber cutting for use of construction poles follows this.

Proper data collection analysis and documentation is vital in planning, forest resources for a sustainable utilisation. However, due to lack of capacity & methodology, data management concerning forest products was very limited. Therefore, this paper focuses on aspects of wood production and consumption in the country during the last five years, and analyses the method of data collection and improvement of the national forest statistics process.

#### 4. The status of forest products

##### 4.1. Wood Products

##### 4.1.1. Productions and Consumption of Wood Products

##### 4.1.1.1. Saw Log

Wood products that are produced locally are saw log and fuel wood.

Logging in Eritrea was started intensively during the Italian colonial era. Up to 1947, 55 sawmills and small wood processing firms were established in the country. (Aldo, 1947, cited in MOA, 1994). The major tree species exploited by the logging companies were *Juniperus procera*, *Olea africana*, *Hyphaene thebaica*, *Balanites aegyptiaca*, and *Acacia albida* / *Faidherbia albida*. At this time, except about four old sawmills, which are most of the time idle or working some times in very low capacity from locally harvested Eucalyptus logs in Asmara, all other sawmills are either non-existent or closed due to lack of sawlogs.

The production and consumption of round wood for timber production during the last 5 years at national level is shown in the following tables.

**Table 2: Production of Round Wood from Locally Harvested Eucalyptus Trees at National Level**

Production year	Production	
	in quintals	in m <sup>3</sup>
1995	9,787	1,631
1996	10,696	1,783
1997	8,222	1,370
1998	11,077	1,846
1999	11,544	1,924
Total	51,327	8,554

N.B. All these saw logs were consumed in the same year. Conversion factor from quintal to m<sup>3</sup> = 6:1.

The sawn timber produced from the above mentioned sawmills are used for the production of boxes, which are mainly used for handling vegetables and fruits. The slabs, which are produced during the process of sawing, are used for firewood. The recovering percentage of the saw logs is about 60%. This rate is acceptable, as the tapering of the saw log is relatively low

**Table 3: Consumption of Round Wood in the Four Sawmills from Locally Harvested Eucalyptus Trees in Tons**

Saw millers	Round wood consumption					
	1995	1996	1997	1998	1999	Total
Tsegay Tekle	624	757	632	651	689	3,353
Syum Tesfay	289	284	133	288	235	1,229
Negasi Hayle	-	-	52	131	-	183
Azalech Okbazgi	66	28	6	38	230	368
<b>Total</b>	<b>979</b>	<b>1,069</b>	<b>823</b>	<b>1,108</b>	<b>1,154</b>	<b>5,133</b>

#### 4.1.1.2. Wood fuel

Where fuel wood and charcoal consumption is concerned, the Department of Energy in co-operation with Lahmeyer International (a company from Germany) has carried out a project “Strengthening the Department of Energy (DOE)” during February 1996-March 1997.

According to this study 78% of the total national energy consumption is consumed at household level and 59% of the total final national energy consumption is from wood fuel.

According to the household energy survey, 69.4% of the total household energy consumption is from fuel wood and 10.7% from charcoal (table 7).

**Table 4: Total Household Energy Consumption: Using a Specimen 1996 Population Estimate of 2.9 million**

Fuel	Quantity	Convert. Factor	Units	Million GJ	Million TOE	%
Fuel wood	1.29Mil.MT	16.6	MJ/kg	21.41	511.1	69.4
Charcoal	0.114Mil.MT	29.0	MJ/kg	3.31	78.9	10.7
Animal Dung	0.37Mil.MT	12.0	MJ/kg	4.44	106.0	14.4
Agra-Residue	0.047Mil.MT	15.0	MJ/kg	0.71	16.8	2.3
Kerosene	0.0229Mil.MT	35.4	MJ/let	0.81	19.3	2.6
LPG	0.00125Mil.MT	45.7	MJ/kg	0.06	1.4	0.2
Electricity	36.1Mil.kwhr	3.6	MJ/whir	0.13	3.1	0.4
<b>Total</b>				<b>30.86</b>	<b>736.6</b>	<b>100.0</b>

The following Table sets out estimated consumption of biomass fuels by households given a hypothetical 1996 population of around 2.9 million

**Table 5: Biomass Energy Consumption 1994-1997 in Physical Units (tones)**

Type of Fuel	1994	1995	1996	1997	Per capita Consumption Rate (1997)	Annual Consumption (Million MT)
Fuel wood	1,292,430	1,334,070	1,375,230	1,418,199	457 kg	1.29
Charcoal	113,766	117,419	121,060	124,831	40 kg	0.114
Animal Dung	359,986	371,332	382,678	394,379	128 kg	0.37
Agri-Residue	47,245	48,773	50,301	51,879	17 kg	0.047

**Table 6: Annual National Energy Demand, Fuel by Sector**

Fuel type	Household (In tones)	Social Institutions	Commercial Enterprises	All other sectors	Total
Fuel wood	1,293,631	462	39,977	0	1,334,070
Charcoal	114,159	13	3,247	0	117,419
Animal Dung	366,170	0	5,162	0	371,332
Agri-Residues	47,146	0	1,627	0	48,773

Note:

1. Social institution includes such as hospitals, boarding schools, hostels, and the like.
2. Commercial enterprise sector includes such as hotels, guest houses, traditional drinks (Brewery), tea shops, snack bars, restaurants, bakeries, injera baking, biscuits and pastries, grain mill, laundry, puncture repair, garage, pottery, lime kiln, brick making, wood workshop, metal workshop, jeweller, and blacksmith.

Based on the above study, the national wood fuel (both fuel wood and charcoal) consumption level is estimated at 1.48 million tons per annum, most of which comprised firewood (90.5%). This figure (1.48 million tons) is obtained from the table figure of 1.45 million tons on the assumption that all the charcoal consumed on a national scale as not carbonised charcoal (i.e., kiln charcoal), rather a substantial amount of this quantity comes from the recycling process of fuel wood at the hearth. Thus, out of the total charcoal consumption, estimated at 117,419 tons, only 20% is considered to be kiln produced, i.e., 23,484 tones, and a kiln conversion efficiency of 30% is assumed (i.e., 6:1 ratio).

The biomass energy consumed within the country is estimated to constitute about 82% of the whole, and of that of this, wood energy is estimated to be about 70%. The share of energy supplies for Asmara is estimated to be:

- Fuel wood and charcoal      80%
- Cow dung and crop residue    5%
- Electricity                        10%
- Gas stoves and kerosene      5%

Asmara the Capital City of Eritrea is found in the Central Highlands of the Country with total inhabitants of about 400,000 individuals. Fuel wood which is consumed in



this city (total annual fuel wood consumption is about 60,000 tons) is obtained mainly from the Western Lowlands and some from Eastern Lowlands of Eritrea. Fuel wood supply for this city, according to the Ministry of Agriculture reports is tabulated in table 10.

**Table 7: Annual Fuel Wood Supply to Asmara City**

No	Year	Wood Supply (in tons)
1	1995	10,466.5
2	1996	19,707.4
3	1997	20,927
4	1998	7,752.9
5	1999	13,155.9

Based on the total annual fuel wood consumption at national level, the city should be importing more than the recorded supply figures. Therefore, the possible explanation for the huge difference is:

- More wood comes into the city than is licensed, through loose guarding of roadblocks, or through unguarded routes.

#### 4.1.2. Import of Wood Products

Currently in Eritrea, it can be said that there is virtually no timber trees left from the natural forest for construction, almost all sawn timber is imported. Around 31,400 cubic meters of sawn timber and semi-finished wood (wood based panels) is imported in average annually. The landed value of sawn wood is currently around US\$ 216 per cubic meter. Matches are produced in Asmara from imported splints. Undoubtedly Eritrea has an expanding need for construction grade softwood timber, spurred by an expanding population and expectations of rapid development.

**Table 8: Imported Wood Products in Quantity**

Description	1995	1996	1997	1998	1999	Total
Sawn wood (m3)	20,511.5	46,509.7	26,249.4	18,429.7	12,362	124,062.3
Wood-Based Panels (m3)	4,701.3	8,308.8	7,673.3	7,369.2	4,666	32,718.6
Coated Papers (MT)	716.5	786.3	523.7	342.5	555.9	2,924.9
Wrapping + Packing Paper + Board (MT)	347.8	636.4	<b>694.5</b>	307.0	717.9	2,703.6
Printing + Writing paper (MT)	879.7	1,170.7	826.3	1,189.4	643.3	4,709.4
Household + Sanitary paper (MT)	35.6	498.0	506.0	748.2	667.4	2,455.2
Fuelwood+Charcoal (m3)	416.0	2,514.8	1,299.1	-	17.6	4,247.5

**Table 9: Imported Wood Products in Value (US\$)**

Description	1995	1996	1997	1998	1999	Total	%
Sawn wood	4,430,491.30	10,046,089	5,669,871.80	3,980,815.6	2,670,197.4	26,797,465	45.3
Wood-Based Panels	2,533,998.50	4,478,442.9	4,135,893.30	3,971,985.3	2,514,960.6	17,635,281	30.3
Coated Papers	696,393.26	764,309.31	509,016.67	332,921	540,327	2,842,967.2	4.9
Wrapping + Packing Paper + Board	307,426.11	562,561.67	<b>613,931.9</b>	271,356	634,644.74	2,389,920.4	4.2
Printing + Writing paper	1,145,434.2	1,524,255.3	1,075,829.4	1,548,571	837,564.1	6,131,654	10.5
Household + Sanitary paper	35,757.64	501,007.64	509,084.4	752,717.36	671,356.5	2,469,923.5	4.4
Fuelwood+ Charcoal	23,713.9	143,345.69	74,048.6	-	1,001	242,109.19	0.4
Total	9,173,214.9	18,020,012	12,587,676	10,858,366	7,870,051.3	58,509,320	100

From 1995 to 1999, the imported value of wood products was US\$ 58.5 million. Sawn wood shares the highest value i.e. 45% followed by wood-based panels, which constituted 30% of the imported wood products. Different paper products such as coated paper, wrapping + packing paper, printing + writing paper and household + sanitary paper share 22% of the total imported wood products. The lowest item imported was charcoal from the neighbouring countries and was less than 0.4%

In 1996 the imported wood products was the highest, i.e. a value of 18 million US\$ (=30%) followed by 1997 which shares 21% of the total importation of wood products in the 5 years.

#### 4.2. Non Wood Forest Products

Aside from wood products, trees and shrubs also produce high value none wood forest products. Among others, the most important none wood forest products in Eritrea are Gum Arabic and Gum olibanum (Table-4). Gum Arabic, which is obtained from *Acacia senegal* is one of the most important none wood forest products in the western lowlands of Eritrea. The Sudanese, in the early of 1950's introduced the business of Gum Arabic collection in Eritrea. However, due to the long drawn out liberation war, the exploitation of gum is minimal.

*Boswellia papyrifera*, which produce Gum Olibanum (Frankincense), is found in the western lowlands in areas called Berakit, Zaide Kolom, Arewai, Tsebab, Jengeren, Mesehalit, Shilalo, Augaro and Adi-Tseser. Tapping and collection of Gum Olibanum started in 1925 by the Somali people and eventually transferred this knowledge to the local people

**Table 10: Major None Wood Forest Products**

Name	Source (species)	Estimated Area (Km <sup>2</sup> )	Potential Pr. (ton/yr.)	Current (ton/yr.)	Common Uses
Gum Arabic	<i>Acacia senegal</i>	4041	>1000	250	-Ingredient for confectionery, beverages, flavourings and pharmaceuticals
Gum Olibanum	<i>Boswellia papyrifera</i>	2198	>2500	450	- Incense

If properly developed, exports of non-forest products especially gum Arabic and gum olibanum could enable the country to earn valuable foreign exchange. At its peak in exportation of gum Arabic, the country obtained in 1995 US\$ 2,050,568 (Table 11). The trend in the last 5 years was going up and down to the production level which correlates with the amount of rainfall, as the source of these products are naturally grown acacia senegal and boswellia papyrifera respectively, which don't benefit from supplementary irrigation.

**Table 11: Export Earnings from Sales of Natural gums (Gum Arabic) in US\$**

Year	Total Export Earnings
1995	2,050,568
1996	245,233
1997	613,067
1998	339,372
1999	474,084
Total	3,722,324

**Table 12: Total Exports Earnings from Sales of Incenses**

Year	Total Export Earnings
1995	464,599
1996	115,140
1997	77,524
1998	126,549
1999	105,398
Total	889,210

Source: Department of Inland Revenue of the Ministry of Finance

## **5. Current status of national forestry statistics related to wood products**

### **5.1. The Existing Methodologies for Data Collection**

The Ministry of Agriculture is the responsible ministry for giving cutting permits of different wood products and controlling the movement of wood products at different checkpoints. The amount and type of locally harvested wood products, which pass the checkpoint, is registered and reported to the zone branch ministry office every week.

Usually reports concerning wood production are sent from the regional offices of the MOA to the head office at national level quarterly, every six months and annually. These data is analysed and compiled in the Division of Forestry and Wildlife.

Wood products, which are imported, are registered at the customs office. The division of Forestry and Wildlife asks the custom's office at least once a year to analyse and compile it accordingly.

In regard to the imported wood products, the Ministry of Finance through its custom office is in charge of data collection and dissemination. The date on imported wood is obtained in terms of local value. The approximate price of the products is used to convert the values in quantitative units. Information on imported wood products could be also obtained from the National Bank of Eritrea, as importers need to open letters of credit (LC) in this bank in order to import goods, hence it could also be used as a means of validation.

Firewood at local level is usually collected and transported to the nearest depot by camels or donkeys. At each depot, there are licensed firewood concessionaires, which buy and transport the wood to the urban centres. These concessionaires have weighing balance at each depot and the amount they bought is registered. The branch of the Ministry of Agriculture at the sub zone level are always monitor and report the amount of wood collected, since the royalty fees are paid based on the amount of wood collected.

The amount of wood, which are collected and utilised at the local level in the rural areas, is difficult to record. In such cases, therefore, the Ministry of Energy and Mines conducts household energy survey by taking samples in the rural households and any interested person or institution can make use of the output of the study.

There are similar problems with the consumption of poles for house construction in the rural areas. In those, which are harvested from the naturally grown trees in the forest or woodland, the users have to ask permit either from the village administrator or nearby office of the Ministry of Agriculture. However, if they are using from their own plantation, they do not need any permit, and thus is difficult to record it in the wood product statistics.

Saw logs for the currently functioning four old sawmills are obtained from Eucalyptus plantation, which are privately owned or from the community plantations. These sawmills are located in Asmara, and any trucks carrying wood products has to be weighed in the municipal truck weighing balance in Asmara, thus the amount of saw logs is well recorded in this station.

Ministries, Institutions, and Organisations, which involve in one way and the other way, in the collection, analysis and dissemination of wood related products are Ministry of Agriculture, Ministry of Local Government, Ministry of Energy and Mines, Ministry of Finance (Customs Office), National Bank of Eritrea, Municipal Offices (City/Town Councils), and Board of Eritrean Standards.

The importance of wood products in Eritrea can be classified into two, i.e. the domestic products and the imported ones. From the locally produced wood products, fuel wood is the most important one followed by pole production for house construction and saw logs from Eucalyptus plantation. All these products are consumed locally as the demand for these wood products in the country is high comparing to the supply. On the other hand, sawn timber has the highest significance followed by Wood-Based Panels and Printing + Writing paper. This is because most of the requirements of sawn timber/lumber are fulfilled from imported material as the locally produced Eucalyptus timber covers only the demand for wooden boxes for carrying fruits and vegetables.

## 6. Evaluation of the data collected and the methodology used

As mentioned above, data concerning wood products are collected from reports and compiled at the Division of Forestry and Wildlife of the Ministry of Agriculture. This type of data is mainly for those forest products that are produced within the country. This is validated by comparing with the royalty fees collected, permits granted to concessionaires, as well as from expert judgement through monitoring in the field.

Regarding the forest products, which are imported from abroad, data are collected from the customs office. This is registered in terms of forest product type and corresponding value, Nakfa, the currency of Eritrea. The weaknesses in this data collection are, the customs office doesn't record the amount either by weight or by volume, and thus it is difficult to convert it accurately into m<sup>3</sup> or ton. However, the imported value of wood products is validated by comparing the letter of credit (LC), which the importer opened in the National Bank of Eritrea while importing the wood products.

Division of Forestry and Wildlife compiles annual reports, after collecting all regional reports obtained from the customs office.

**Table 13: Strength and Weaknesses Matrix**

Setting	Strength	Weakness
Sub-Regional level (MOA)	<ul style="list-style-type: none"> <li>. Forest guards at every check points are available</li> <li>. Permits are granted and Controlled</li> <li>. Data are collected daily</li> <li>. Reports are forwarded every week</li> </ul>	<ul style="list-style-type: none"> <li>. No measurement at check point</li> <li>. Locally consumed wood products are not well recorded &amp; controlled</li> <li>. No computer facilities for data processing</li> </ul>

Regional Level (MOA)	. Reports are compiled and forwarded to head quarter . Cutting & collecting permits are granted and well controlled . Royalty fee collected and well recorded	. No systematic record of data . Lack of skilled manpower & computer facilities
National Level (MOA)	. Computer facilities are relatively better . Compiled annual reports available	. Shortage of manpower . Lack of systematic data collection and validation
Customs Office (MOA)	. Imported wood products are recorded at port of entry	. Imported wood products are not recorded in terms of quantity (m <sup>3</sup> )
Department of Energy	. Biomass study survey is conducted systematically at national level	. Biomass survey is not regularly conducted

## **7. Conclusion and recommendations for improvement of the national forestry statistics process**

Lack of accurate data and information on the production and consumption of forest products is a bottleneck for a sustainable forest/woodland management in Eritrea. In order to have meaningful data and information concerning wood products, however the following points are recommended: -

- ◆ Promote co-ordination of data and information found in different organisations;
- ◆ Measurements of forest products has to be standardised and accurate conversion factor is needed;
- ◆ Production and consumption survey especially for fuel wood & charcoal should be done regularly;
- ◆ The system of data collection on wood products is obtained from the concerned institutions (like the customs office) upon request. Therefore, easy access to available data should be organised;
- ◆ The forestry sub-sector is constrained with limited capacity to handle and process wood products data and disseminate to the clients. Therefore, training of forestry staff in data base management is very important;
- ◆ Regional and sub-regional offices of the MOA should be equipped with computer facilities so that data and information on forest products can be easily transferred through e-mails on time;
- ◆ Reporting formats need to be easily understandable and thus, it has standardized

- ◆ Production and consumption assessment on pole and other round wood products outside the forest, that is consumed locally, should be conducted, since there is lack of data on these products.

In conclusion, all wood products, no matter if they are imported or exported have to be well recorded, analysed, validated and disseminated to data users. These data also need to be updated regularly.

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