FINAL TECHNICAL REPORT

EXECUTING AGENCY: Forestry Research Institute of Ghana

SERIAL NUMBER: ITTO Project PPD 63/02 Rev. 1 (I)

PROJECT TITLE: Investment Promotion and Enterprise Development of the Timber Industry in Ghana

PLACE AND DATE: Kumasi, March 2004
1. ABSTRACT

As part of efforts to revamp and rehabilitate Ghana’s economy the government of Ghana initiated an Economic Recovery Programme (ERP) in the mid-1980’s. The timber industry benefited from an amount of approximately US $142 million, which was to facilitate the acquisition of new equipment and machinery to enhance production efficiency. This led to an increase in wood export earnings from US $ 15 million in 1983 to US $200 million in 1995. However, detailed investment analysis and enterprise development studies were not done prior to the massive injection of capital into the timber industry thereby leading to uncontrolable expansion and the current bleak future for some organisation, which benefited from the scheme.

This pre-project study evaluated investments in the timber industry with a view of helping managers; decision-makers and policy makers formulate appropriate strategies to ensure the sustainable development of timber enterprises. The project also examined ways in which problems associated with over-capacity of the timber industry can be addressed. Data generated by this project and the conclusions reached are presented in this report.

The methodology for this pre-project study involved interviewing key decision makers in selected enterprises in the industry, analysing financial statements of some existing enterprises, consulting key players in the timber industry, workshops, desk studies and review of previous studies.

A diagnosis of the timber industry over-capacity problem indicated that low timber pricing and discretionary allocation of resources are the main forces driving the over-capacity problem in the timber industry.

The study also found that there is a scarcity of timber resources due to over capacity of mills and poor recovery rates. The analysis have also shown that exploitation is concentrated mostly on the few prime species (i.e. scarlet species), followed by the red star species with pink star species which contains the bulk of resources marginally exploited.

The key industry and investment promotion constraints that hinder industry growth and currently resulting in weak liquidity, high gearing and low profitability for the industry were identified as; high cost of funding, lack of access to equity capital, lack of good corporate governance, inappropriate and obsolete machinery and equipment, technological constraints and less market-oriented enterprise management.

Furthermore, the study indicated that most investment appraisal decisions were not based on tried and tested discounted cash flow analysis and virtually no culture of preparing budgets and strategic plans for small and medium enterprises in the industry. Issues of risk management were rarely given the priority they deserve in the industry.
2. INTRODUCTION

The Economic Recovery Programme (ERP) was introduced in 1983 following a persistent decline in the performance of Ghanaian economy during the late 1970’s and early 1980’s. The programme was used to undertake a successful transition from an administrative system of economic management to a market economy and all sectors of the economy, including the timber industry were revamped and rehabilitated.

Investments of approximately US$ 142 million were made in the timber industry for the acquisition of new equipment and machinery to enhance production efficiency. As a result of the investments, wood export earnings rose from US$ 15 million in 1983 to US$ 200 million in 1995.

Even though significant improvements of the timber industry were achieved as a result of the investments, most analysts believe that better results could have been achieved if the investments had been appraised before implementation. For example, about 55% of the investment went into improving the primary processing capacity, while 33% and 11% of the funds were invested in the secondary and tertiary processing sectors of the industry. The investment led to an increase in the number and efficiency of primary processing plants (horizontal growth) rather than an expansion in the downstream or value-added processing capacity (vertical growth) of the industry. The lack of detailed investment analysis and enterprise development may have led to the uncontrolled expansion of the timber industry and the current bleak future for some timber organisations that benefited from the scheme.

Studies have been carried out on investments at the macro-level in relation to sustainable utilisation of timber resources. The ITTO funded project “Industrial utilisation and marketing of some Ghanaian Lesser-Used Timber Species from sustainably managed forests [PD 179/91 Rev.2 (M,I)]” looked at the provision of effective linkages among timber resource availability, product development and marketing of lesser used species (LUS) to promote sustainable forest management in the tropical high forests of Ghana. No critical investment evaluation at the micro-level was done though the project identified that one of the key constraints to the effective promotion and marketing of LUS was that of investments at the enterprise level.

Another study, “Wood Sector Development Project (WSDP)”, which was supported by the European Union indicated that the industry needs a major investment in re-tooling to enable the industry become competitive. However, the programme recommended that an investment analysis be conducted before any re-tooling exercise is initiated.

A more recent study (August 2001) by the Forestry Commission, “Ghana Wood Industry & Log Export Ban Study” expressed concern that forest resource pricing is currently not based on market forces and that this was distorting the timber market resulting in poor investments in the timber industry. The study recommends the development and implementation of more efficient measures, including policy and legislative review on
pricing of timber products, effective implementation of market-based competitive pricing mechanisms and investment analysis to ensure efficiency in the timber industry.

The central theme of this pre-project is therefore to critically evaluate investments in the timber industry with the view of helping managers; decision makers and policy makers to formulate appropriate strategies to ensure the sustainable development of wood-based enterprises.

This project is important because the forestry sector contributes about 6% to Gross Domestic Product (GDP) and provides direct employment to over 100,000 people and indirect employment to over 2.5 million Ghanaians, who derive a major proportion of their cash income from sale and utilisation of timber and non-timber products (e.g. bushmeat, mushroom, fruits, canes, chew-sticks, etc). The forestry sector also plays an important role in the socio-economic development of the country with wood fuel consumption for domestic and industrial energy uses amounting to about 16 million cubic metres valued at approximately US $250 million. The timber industry also earns large foreign exchange for the country. In the year 2000, the industry earned US $175.24 million and was fourth after minerals, cocoa, and tourism.

In recent times however the forestry sector, especially the timber industry, is characterised by general declining performance arising mainly from low conversion efficiency, increasing socio-economic pressures on resource utilisation, over-exploitation and poor investments in material and human resources. The declining performance has to be reversed if major economic and social disruptions in the economy are to be avoided.

The developmental objective addressed by this pre-project is to ensure sustainable forest management in Ghana. The specific objectives are: to analyse the over capacity in the Ghana wood industry; to develop an investment promotion and enterprise scheme for the wood industry.

The methodology for this pre-project involved interviewing key decision makers in selected enterprises in the timber industry, workshops and consultations with the major stakeholders in the timber industry. Limited analyses of financial statements of existing enterprises were conducted. Study reviews were also conducted and limited statistics on foreign direct investments was obtained from the Ghana Investment Promotion Centre.
3. MAIN TEXT

PRESENTATION AND ANALYSIS OF DATA

Output 1.1: Factors Influencing Over-Capacity in the Ghana Wood Industry Assessed

Greater pressure for forest resources, especially timber, and the broadening of heavily exploited species base to include most of the lesser used species (LUS) has dwindled the raw material base and also resulted in greater disturbance and consequently damage to the biodiversity of the forest. The extent of over-capacity and the factors influencing the over capacity is yet to be analysed.

Activity 1.1.1: Identification of reasons for the over-capacity in the timber industry

*Introduction*

The overcapitalisation of the industry can be traced back to the economic crisis in the late 1980s, which prompted the IMF and development partners to fund loans for wood processing in order to boost much-needed export earnings. Tax and other fiscal incentives were introduced, and concession holders permitted to undertake salvage felling. During the latter part of the 1990s there was a deepening of investment into value-added processing. This activity therefore sought to analyse the extent of the over-capacity problem and to identify the factors influencing it.

*Methodology*

The methodology for this activity involved industry round interviews and desk study. Thirty managing directors and forest managers of randomly selected timber mills were interviewed. In addition results of previous studies addressing similar issues were reviewed.

*Findings*

**Diagnosis of the Timber Industry Over-Capacity problem**

The wood industry has attracted a high rate of investment during the 1990s. Table 2 shows the Study's estimate (based on Ghana Statistical Service data) of capital good imports.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dryers</td>
<td>10,416,132</td>
<td>855,572</td>
<td>3,539,471</td>
<td>1,412,852</td>
<td>5,807,895</td>
<td>16,224,027</td>
</tr>
<tr>
<td>Machines</td>
<td>45,878,769</td>
<td>19,638,915</td>
<td>13,974,871</td>
<td>4,298,973</td>
<td>37,912,759</td>
<td>83,791,528</td>
</tr>
<tr>
<td>Tools</td>
<td>12,177,794</td>
<td>5,796,681</td>
<td>4,367,539</td>
<td>3,789,110</td>
<td>13,953,330</td>
<td>26,131,124</td>
</tr>
<tr>
<td>Total</td>
<td>69,177,794</td>
<td>26,291,168</td>
<td>21,881,881</td>
<td>9,500,937</td>
<td>57,673,984</td>
<td>126,851,778</td>
</tr>
</tbody>
</table>

The baseline technical census carried out by Birikorang reveals the subsequent breakdown of the capacity of the wood industry (Table 3). There was an increase in investment in primary processing as well as in kiln drying capacity: overall installed processing capacity rose to 5.1 million m$^3$ (five times the estimated sustainable yield); drying capacity rose to 201,600 m$^3$ (an excess capacity of 38%).

### Table 3: Ghana Wood Industry Capacity Estimates

<table>
<thead>
<tr>
<th></th>
<th>No. of Lines</th>
<th>Basic line capacity (m$^3$)</th>
<th>No. of Resaws</th>
<th>Basic Capacity (m$^3$)</th>
<th>Incremental resaw capacity</th>
<th>Total mill capacity (m$^3$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sawmills</td>
<td></td>
<td>16,128</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SMALL</td>
<td>31</td>
<td>20</td>
<td>499,968</td>
<td>80,632</td>
<td>580,600</td>
<td></td>
</tr>
<tr>
<td>MEDIUM</td>
<td>49</td>
<td>36</td>
<td>790,272</td>
<td>145,137</td>
<td>935,409</td>
<td></td>
</tr>
<tr>
<td>LARGE</td>
<td>98</td>
<td>86</td>
<td>1,580,544</td>
<td>346,717</td>
<td>1,927,261</td>
<td></td>
</tr>
<tr>
<td>Rotary Mills</td>
<td></td>
<td>24,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SMALL</td>
<td>9</td>
<td></td>
<td>216,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LARGE</td>
<td>23</td>
<td></td>
<td>552,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sliced Veneer Mills</td>
<td></td>
<td>24,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SMALL</td>
<td>4</td>
<td></td>
<td>96,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LARGE</td>
<td>33</td>
<td></td>
<td>792,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggregate Capacity</td>
<td>247</td>
<td>142</td>
<td>4,526,784</td>
<td></td>
<td>5,099,270</td>
<td></td>
</tr>
</tbody>
</table>

Source: Table A17.1, Birikorang, 2001.

In well-functioning market, with open access to timber resources, the timber industry would be expected to expand up to the point where individual companies make normal economic profits. But the Ghanaian forest sector, reflecting the economy as a whole, has been beset by policy and market failures (including in particular the discretionary allocation of concessions and permits, low real value of royalties). These have resulted in under-valuation of the forest resource, which has furthered encouraged harvesting and processing investments and hence the overcapacity of the timber industry. But concomitantly this has had high environmental as well as political and social costs.

**Factors influencing Over-Capacity in the Timber Industry**

**Low timber pricing**

The continued over-harvesting characterizing industry development is predicated on a forest policy that protects the industry from international competition and maintains artificially low domestic log prices. Pricing policy is further rendered ineffective through the maintenance of low stumpage rates that in real terms cost the State some US$6 million in the first two years of this decade.
**Discretionary allocation of resources**

The state also practices a discretionary allocation of resources, while large amounts of stumpage remain uncollected on annual basis and the state suffers real losses. The resulting potential for rent-seeking behaviour in the public domain and conditions under which the State continues to pre-finance the forest industry have undermined the objectives of MLF’s Forestry Development Master Plan.

**Activity 1.1.2: Assess the policy, legislative and institutional structures that the government has put in place to deal with the issue of wood industry over-capacity**

**Introduction**

The government of Ghana has put in place a number of measures to address the problem of over capacity in the timber industry. Among them are competitive bidding for timber rights, salvage felling, and log tracking systems. However, the impacts of these measures are yet to be assessed. This activity aimed at assessing the impact of policies, legislative and institutional structures put in place by the government to solve the over-capacity problem in the timber industry.

**Methodology**

The methodology adopted was basically a desk study, which included literature search and review of previous studies. Policy documents were obtained and analysed. The Ghana Investment Promotion Act, 1994 (Act 478), the Free Zone Act, 1995 (Act 504), and the Timber Resources Management Act, 1997 (Act 547) were obtained and analysed.

**Findings**

**Assessment of the span of control over total harvest area**

Forest policy in 1979 sought to direct primary species into local factories within the framework of an assumed efficient regulatory and inspectorate system supported by a grading and mensuration system. It was expected that the future availability of the wood material in regular demand by processing mills would be secured. In 1995, policy focused on sustainability of business enterprises and security of the raw material base was revisited. Environmental considerations commanded priority over revenue objectives.

Over-harvesting and a “growing but not developing” industry are indicators of forest polices that have not worked.

A new policy of allocating timber resources through competitive bidding for timber rights has received legal backing (L.I. 1721, 2003). The relevance of the competitive bidding mechanism is yet to be tested, as the State has since 2001 issued by administrative means
Timber Utilization permits to industry applicants and more recently Salvage Permits to about half the number of the wood industry. From preliminary assessments of harvest areas made under this study, over 20,000km² of forest area comprising permits and extant leases more than favourably compares with a maximum area estimate of 4,000km² in both forest reserves and off-reserve areas that could be made available.

**Institutional framework to address over-capacity**

The Forestry Commission carries a mandate to manage and at the same time regulate the forest, but it is Forest Service Division (FSD) - the supply-side regulatory body - and Timber Industry Development Division (TIDD) - the demand-side regulatory and inspectorate body - are unable to establish a control procedure for monitoring harvest and relating it to the industry's wood flow. A log tracking system has been conceived, but will require industry participation to work.

**Activity 1.1.3: Consultation with Government and the private sector on issues facing the timber industry**

**Introduction**

The timber industry is beset with a number of problems, which needs to be given the needed attention if indeed we want the industry to grow sustainably. The main objective of this activity is to know the issues facing the timber industry from the perspective of the major stakeholders.

**Methodology**

Consultations were held with the major stakeholders in the timber industry. In all thirty industry participants were consulted. This included twenty-six managing directors of selected mills, the presidents and executive secretaries of the Ghana Timber Millers Organisation and Ghana Timber Association, members of Forestry Commission (FC) and forest dependent communities.

**Findings**

When asked what is the major problem in managing a forest products company in Ghana, the answer given by virtually every manufacturer was consistently and emphatically the same. The difficulty in obtaining raw material, the acquisition of logs overwhelms all other difficulties. Forest resources are being depleted at a rate significantly greater than the sustainable yield. This fact, combined with the illegal harvesting of trees, the large over-capacity to process logs, and other factors, has created a demand that grossly exceeds the sustainable yield. The problem is so acute, that even the most casual observer must question the long-term vitality of an industry that cannot acquire wood.

Furthermore, the socio-economic impact of the closure of mills that may be the only regional employer will be devastating to impacted regions. Socio-economic catastrophes
of the type envisaged with the demise of the forest products industry will have cataclysmic effects on the regional ecosystems. Local people, with no other options, will revert to looking for food and other life necessities in the local ecosystems. The excessive cutting of trees for fuel and other purposes, hunting wildlife, and doing other things in excess will cause substantial environmental havoc. However, it is naive to think that the courageous actions that need to be taken now will not have extremely harsh local ramifications. However, the result of inaction in the near future does not appear to be an option. Indifference to the current situation will result in cataclysmic social and environmental impacts throughout Ghana with much higher economic, social, and environmental costs.

If the shortage of raw materials was not sufficiently problematic, many industry leaders are upset by Forest Commission (FC) policies that involve the awarding of concessions to those needing trees to harvest. Their complaints include accusing the FC of being capricious, thoughtless, and corrupt. It was said that concessions are often awarded to individuals who have no equipment to do timber harvesting, and therefore, intend only to resell the concession for a significant profit. This makes these people middlemen in the flow of raw material into finished product. Their profit margin, which is an additional cost to the log processor who buys the concession from the person to whom it was awarded, reduces what little profit exists in producing and marketing forest products.

Finally, there is another government-related issue that negatively impacts mill operators, about which, they feel powerless to address. When export sales are made, exporters get paid by the Ghanaian customs office through which all transactions flow. However, when foreign currency gets converted into Ghanaian currency (cedis), the exchange rate is often less favourable to the exporter than that which would be obtained at a bank. In effect, the exporters are being taxed another 3-5 percent at the point of currency exchange. Profit margins in the Ghanaian forest products industry are thin. The issues mentioned above, and others, are deterring from, not only corporate profitability, but in the opinions of some, the long-term survivability of the entire industry.

It appears that the majority of producers felt that the key to increasing profitability, and therefore, stimulating investment, is adding more value, not increasing volume. However, despite the best efforts to increase value, there appears to be institutional impediments to achieving a competitive advantage. For example, at one company in one week, 40 out of 121 logging trucks did not reach the mill in a timely manner due to multi-day delays resulting from difficulties with paperwork and other administrative matters as the trucks reached check points on the road.

The regulatory environment, together with bureaucratic and a variety of other obstacles, precludes the Ghanaian industry from competing favourably in West African and other markets with countries. For example, the Ivory Coast, which has higher labour, fuel, and other relevant costs, can often sell products in the international market at better prices than the Ghanaians. In Cameroon, the forest products cartel is able to keep foreign competitors out of their market. War in the Congo precludes entry into that market.
Output 1.2: Capacity of Forest Resource Base to Support Increased Investments in the Timber Industry Assessed

The injection of massive capital into the timber industry in the mid 1980's to revamp the sector led to uncontrolled expansion, especially in the primary and secondary processing sectors. The expansion culminated in increased exploitation of timber resources, causing the resource to dwindle over the years. Currently, the capacities of all the mills put together exceed the annual allowable cut of 1 million cubic meters that will ensure sustainable levels of harvesting. This means that any additional capacity is not possible and any upgrading of the industry has to be seen within the existing sustainable capacity of the forest.

Therefore, for increased investments in the timber industry, a critical assessment of the resource base is necessary to ascertain the kind of resources available and the suitable areas for investment.

In the light of the above, the focus of this output is to do an assessment of the availability of resources for utilisation or processing and determine the potential areas for investment based on the type of resources, amount available and distribution of the resource.

Activity 1.2.1: Assess resources available for utilisation by the timber industry

3.1 Introduction

The Forestry Commission (FC) has set the AAC at 1 million m³ per year. However, the timber industry is estimated to have an installed capacity of about 5 million m³ per year (FC, 2001). This is a cause for great concern as the 1 million m³ per year AAC can only satisfy just about one fifth of the timber requirements of the industry. This activity therefore made an assessment of the availability of resources for utilisation or processing by the timber industry.

Methodology

The main data collection approach adopted for the study was a desk study. This included library search and the identification of relevant forest resource related documents through informal consultations with staff of the Forestry Commission (FC), Resource Management Support Centre (RMSC) and Timber Industry Development Division (TIDD). The 1996 National Off-reserve forest (ORF) and 2002 National Timber Inventory report were obtained and analysed to determine the stem numbers of species that could be extracted from production reserves per year.
Findings

Reserve and Off-Reserve Areas

There are five major timber producing regions. However, not all the reserves are good enough for timber production. For instance, Western Region has forty one (41) forest reserves but only twenty seven (27) of them are timber production reserves, the rest are not natural timber production areas but are under different forest management options, such as plantation, convalescence and protection. Western region has the greatest proportion of its land area permanently dedicated to forest reserves (i.e. 31% of land area, which is 700,880ha) and Eastern region has the least (8% of land area, which is 153,750ha). From Table 2 even though Central region has the least land area under forest reserve, (110,730 ha), most of these areas are under production (66%). This situation indicates that, most of the reserves in this region are in good condition.

Table 2. The Area of Forest Reserves in Each Region

<table>
<thead>
<tr>
<th>Region</th>
<th>Land Area</th>
<th>Area Inside Forest Reserve</th>
<th>% Of Area Inside Reserves</th>
<th>Production Reserve Area</th>
<th>% Of Reserves Under Production</th>
<th>Area Outside Reserves</th>
<th>Area Outside Reserves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashanti</td>
<td>2,446,963</td>
<td>383,900</td>
<td>15.69</td>
<td>126,400</td>
<td>32.93</td>
<td>2,063,063</td>
<td>2,063,063</td>
</tr>
<tr>
<td>Brong Ahafo</td>
<td>990,600</td>
<td>264,060</td>
<td>26.66</td>
<td>126,300</td>
<td>47.83</td>
<td>726,540</td>
<td>726,540</td>
</tr>
<tr>
<td>Central</td>
<td>959,676</td>
<td>110,730</td>
<td>11.54</td>
<td>73,400</td>
<td>66.29</td>
<td>848,946</td>
<td>848,946</td>
</tr>
<tr>
<td>Eastern</td>
<td>1,892,469</td>
<td>153,750</td>
<td>8.12</td>
<td>70,200</td>
<td>45.66</td>
<td>1,738,719</td>
<td>1,738,719</td>
</tr>
<tr>
<td>Western</td>
<td>2,256,028</td>
<td>700,880</td>
<td>31.07</td>
<td>323,000</td>
<td>46.08</td>
<td>1,555,148</td>
<td>1,555,148</td>
</tr>
<tr>
<td>Total</td>
<td>8,545,738</td>
<td>1,613,240</td>
<td>18.88</td>
<td>719,300</td>
<td>44.59</td>
<td>6,932,416</td>
<td>6,932,416</td>
</tr>
</tbody>
</table>

1 Source: FD Report on the Off-Reserve Timber Resource Situation
2 Source: FC 2001 Multi Resource Inventory Results
3 Source: FC 2001 Multi Resource Inventory Results

The Annual Available Timber Resources

The AAC has been designated as 1 million cubic meters, with the off-reserve areas and reserves contributing equally to this quota that is 500,000 m$^3$ each of timber resources. This supply is woefully inadequate in the face of a milling capacity of 5 million m$^3$ estimated in 1999 and the possibility of further expansion.

The Annual Allowable Cut of Timber:

Outside Reserves $= 500,000 \text{ m}^3$
Forest Reserves $= 500,000 \text{ m}^3$

The Available Timber Resource Off-Reserve

The OFR quota was determined based on the total stocking obtained after the 1996 National OFR inventory. The OFR timber resource is not secure therefore forecast of future stocks cannot be made and yield cannot be determined by a formula. This means
that we cannot have an AAC that can be removed every year in perpetuity without jeopardizing the growing stock.

However, because of the need to provide guidance on the amounts of timber that might come from the OFR, the principle applied was to try and estimate how long the existing resource might sustain a pre-determined AAC. This was done by dividing the total stocking by an AAC, (Wong, 1996). After making allowances for the heavy level of damage, dead and rotten trees, it was estimated that a cut of about 504,086 m³ (45,826 trees) per year (Table 3) could be sustained for around 55 years without replacement.

Table 3: Quota for Off-Reserve Areas by Star Category

<table>
<thead>
<tr>
<th>Star Category</th>
<th>No. of Trees</th>
<th>Volume (m³)</th>
<th>% by Volume of Quota</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scarlet</td>
<td>4,464</td>
<td>49,104</td>
<td>9.74</td>
</tr>
<tr>
<td>Red</td>
<td>20,750</td>
<td>228,250</td>
<td>45.28</td>
</tr>
<tr>
<td>Pink</td>
<td>20,612</td>
<td>226,732</td>
<td>44.98</td>
</tr>
<tr>
<td>Total</td>
<td>45,826</td>
<td>504,086</td>
<td>100</td>
</tr>
</tbody>
</table>


1 Volume determined using standard average volume per tree of 11 m³ derived from the 2001, multi resource inventory results.

Table 3 above gives the felling quotas for the three main star categories. As can be seen, the largest quotas are found in the Red and pink star categories (i.e. 45.28% and 44.98% respectively). This trend is due to the high exploitation of the few prime species, which are in the scarlet category over the years. The implications are to ensure sufficient and sustainable supplies of all the categories of timber resources, more of the red and pink stars should be utilised. The quota as indicted above is sustainable for only 55 years until plantation stock takes over, thus any shifts above this level will create gaps, leading to a reduction in the number of sustainable years.

In 2003, a provisional quota of 1 million m³ (Table 4) has been allocated for removal from the OFR alone. This is to salvage trees for plantations to start. This quota is twice the AAC from this area. This implies a year’s yield would be removed in addition to that of the current year. Also if this yield is allowed to continue in perpetuity, then more resources would be available for utilization i.e. AAC = 1,500,000 m³, however, the number of years available for the supply of natural timber from the OFR would be halved.
Table 4: Provisional Quota for Off-Reserve Areas for the year 2003

<table>
<thead>
<tr>
<th>Activity</th>
<th>Number of Trees</th>
<th>Equivalent Volume (m$^3$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timber exploitation</td>
<td>68,944</td>
<td>995,000</td>
</tr>
<tr>
<td>Canoe carving</td>
<td>150</td>
<td>3000</td>
</tr>
<tr>
<td>Wood carving</td>
<td>200</td>
<td>2000</td>
</tr>
<tr>
<td>Total</td>
<td>69,294</td>
<td>1,000,000</td>
</tr>
</tbody>
</table>


Available Forest Reserve Timber Resources

The forest services divisions, 2001, forest inventory results on the timber production areas within the permanent forest estates of the Ghana High Forest Zone (GHFZ) estimated a national standing volume of 116,792,741 m$^3$ (29,678,318 trees) that are of form suitable to be classified as timber.

Using this same inventory results, the indicative felling levels (IFL) which is the static volume (m$^3$) or stem numbers of economic species, that could be extracted from production forest reserves per year have been estimated as 584,686 cubic meters or 53,153 trees (Table 5). This value (i.e. IFL) is just a little above the AAC of 500,000 cubic metres. This AAC in principle is that fraction of the total forest increment that could be removed annually and still ensure the maintenance of an optimum reserve stock and the provision of timber resources, at least at this level in perpetuity.

Table 5: The Stocking Levels and IFL Estimated for all the Production Reserves

<table>
<thead>
<tr>
<th>Total Stocking ≥ 30cm</th>
<th>Volume; total Stocking ≥ 30cm (m$^3$)</th>
<th>Total Stocking &gt; FL</th>
<th>Volume Total Stocking &gt; FL</th>
<th>IFL stem</th>
<th>IFL Volume (m$^3$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>29,678,318</td>
<td>116,792,741</td>
<td>5,646,505</td>
<td>42,294,840</td>
<td>53,153</td>
<td>584,686</td>
</tr>
</tbody>
</table>

Source: FC 2001 Multi Resource Inventory Results
FL - Felling Limit
IFL - Indicative felling levels

Table 6: Indicative Felling Levels by Star Categories

<table>
<thead>
<tr>
<th>Star Category</th>
<th>IFL</th>
<th>% of NIFL Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of stems</td>
<td>Volume (m$^3$)</td>
<td></td>
</tr>
<tr>
<td>Scarlet</td>
<td>4,887</td>
<td>53,747</td>
</tr>
<tr>
<td>Red</td>
<td>3,725</td>
<td>40,988</td>
</tr>
<tr>
<td>Pink (+ Green)</td>
<td>44,530</td>
<td>489,841</td>
</tr>
<tr>
<td>Others (Gold &amp; Blue)</td>
<td>10</td>
<td>109</td>
</tr>
<tr>
<td>Total</td>
<td>53,152</td>
<td>584,685</td>
</tr>
</tbody>
</table>

Source: FC 2001 Multi Resource Inventory Results
NIFL - National Indicative Felling Level
Table 6 presents the relative contributions of the various star categories to the NIFL. It is evident from the table that pink star species dominates (i.e. 83%) in the number of species that could be extracted annually. With this high contribution to the NIFL or AAC, it is important that pragmatic efforts are made to promote those species in this category, which are exploited at very low levels, to alleviate the pressure on the few preferred species in the scarlet and red star categories. However, if loggers continue to concentrate on the extraction of the scarlet and red star species, it will lead to their depletion and eventual extinction.

**Timber Production in 2002**

From Table 7 below the total official log production in 2002 (1,104,351 m$^3$) was higher than the AAC of 1 million m$^3$. When we consider that there are many chainsaw operators producing logs illegally in the system, then it is obvious that the AAC was exceeded by quite a significant margin. For instance, Forestry Commission (2001) estimated a total harvest of 3.72 million m$^3$ in 1999. The legal harvest was 1.09 million m$^3$, the illegal harvest 0.925 million m$^3$ and the round wood equivalent of chain saw lumber was 1.696 million m$^3$.

Also Table 7 indicates that about 37% (i.e. 405,415 m$^3$) of logs extracted in 2002 were in the scarlet star class instead of the 102,851 m$^3$ (9.45%) that should have been removed. This has been the general trend in the industry and if allowed to continue, a total depletion of the scarlet species would result.

### Table 7: The National Annual Available Timber and Actual Log Production by Star Category for 2002

<table>
<thead>
<tr>
<th>Star Category</th>
<th>National Annual Available Timber$^1$</th>
<th>Log Production 2002$^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Volume (m$^3$)</td>
<td>% of AAC Volume</td>
</tr>
<tr>
<td>Scarlet</td>
<td>102,851</td>
<td>9.45</td>
</tr>
<tr>
<td>Red</td>
<td>269,238</td>
<td>24.73</td>
</tr>
<tr>
<td>Pink</td>
<td>716,573</td>
<td>65.81</td>
</tr>
<tr>
<td>Others$^3$</td>
<td>109</td>
<td>0.01</td>
</tr>
<tr>
<td>Total</td>
<td>1,088,771</td>
<td>100</td>
</tr>
</tbody>
</table>

1 Source: Figures are inferred from Tables 3 and 6  
2 Source: TIDD Data Processing Section – June, 2003  
3 Others: Gold and Blue Star classes

**Activity 1.2.2: Assess logging residue generation by the timber industry**

**Introduction**

Logging is carried out principally for the purpose of timber production. The various sections not extracted constitute logging residue. These may include stumps, butt-end off-cut, crown-end off-cut, and branchwood. This is regardless of whether it is
economically and technologically feasible or not to utilise such material. Logging waste on the other hand is that portion of the residue, which within the framework of current technology and price levels cannot be utilised or extracted (Nketiah, 1992).

Several researchers have attempted to classify and quantify logging residue. Otoo (1978), in his assessment involving 30 trees and comprising six species reported a 30% residue production in the form of butt, and log top-end off-cuts and log rejects in the forest. Frimpong-Mensah (1989), also estimated logging waste in Ghana to be in the range of 25-50% of the standing tree volume. This activity sought to assess logging residue generated by the timber industry and to explore the possibility of processing this residue for utilisation by the timber industry.

Methodology

This activity was carried out through desk study. By adopting the relations determined and used by Nketiah (1992), the study generated data on residue generation by type using data obtained from Timber Industry Development Division records on extracted bole or logs volume. The potential uses of logging residue were also determined. Relevant literature on residue generation was also reviewed.

Findings

Logging Residue Generation and Availability

By adopting the relations determined and used by Nketiah (1992), Table 8 was deduced.

<table>
<thead>
<tr>
<th>Period</th>
<th>Extracted Log Volume (m³)</th>
<th>Stump Volume (m³)</th>
<th>Butt-end Off-cut Volume (m³)</th>
<th>Crown-end Off-cut Volume (m³)</th>
<th>Branches Volume (m³)</th>
<th>Total Residue Volume (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan – Dec 2002</td>
<td>1,104,351</td>
<td>159,467.4</td>
<td>141,785.9</td>
<td>299,251.6</td>
<td>511,541.2</td>
<td>1,112,046.1</td>
</tr>
<tr>
<td>Jan-June 2003</td>
<td>491,748</td>
<td>71,008.7</td>
<td>63,135.4</td>
<td>133,252.8</td>
<td>227,782.5</td>
<td>495,179.4</td>
</tr>
</tbody>
</table>

About the same volume of wood extracted as logs is left in the forest as residue (Table 8). The branches contributed the greatest volume to the residue and it has been observed that appreciable amount of wood is obtainable from them. However their extraction does not seem very attractive because it will involve very intensive work and probably require special handling and processing machines (Ofoe-Asiedu et al. 1993). The butt-end and crown-end off-cuts contributing about 39% of the total residue have been found to contain considerable amount of high quality wood. They are normally cut off due to butt swells, buttresses, small diameter, natural and physical defects.
Activity 1.2.3: Identify potential areas for investment based on availability of resources

Introduction

The Ghanaian forest products industry is beginning to move towards the production of downstream products, such as finger-jointed lumber, laminated products, and some composite lumber and panel's products. There are a number of product lines that appear to have the potential for adding considerable value to Ghanaian raw materials. Several companies are already considering many of these. However, there are others whose potential has not yet come to the attention of the industry. This activity identified the potential areas suitable for investment based on the quality and type of timber resources available.

Methodology

The methodology for this activity involved interviewing key decision-makers in selected enterprises in the timber industry. Thirty managing directors and forest managers of selected timber mills were interviewed. Study reviews were also conducted.

Findings

Potential Uses of Logging Residues

Logging residue usage has not gained the prominence that it requires even though it has several potential uses such as in Table 9.

<table>
<thead>
<tr>
<th>Residue Type</th>
<th>Branch Wood Volume %</th>
<th>Crown-end Off-cuts</th>
<th>Butt-end Off-cuts</th>
<th>Defective logs</th>
<th>Stumps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential Uses</td>
<td>Furniture, Chips, small Dimension products (parquet flooring, profile and skirting boards) Fuelwood and Charcoal</td>
<td>46.00</td>
<td>26.91</td>
<td>12.75</td>
<td>Not Assessed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

16
Potential Uses of Milling Residues

Milling residue as have mainly been used to generate process steam particularly for kiln drying at the mills or sold out as fuelwood. In some instances the disposal of milling residue such as sawdust has posed as a major problem. It is only the few companies that have integrated forward, into finger jointing and moulding ventures that make use of some of their fall downs and also those plymills with gangsaws convert their peeler cores into lumber.

Just like in the case of the logging residues, milling residue may have a lot of economic value and uses if investment is made into machinery that could convert them into useful products. As a matter of urgency, attempts should also be made at improving recoveries from the main raw materials (logs) since this is the surest way of efficiently using the resources. Table 12 below gives information on the types of residues, how they could be converted into useful products by value addition and above all how recoveries could be improved from the logs. The table also includes information on technical equipment or issues that require attention for the achievement of the above.

Table 12: Types of Residue and Technical Measures Required for their Usage

<table>
<thead>
<tr>
<th>Type of Residue or Material</th>
<th>Logs</th>
<th>Sawdust &amp; Shavings</th>
<th>Slabs &amp; Edgings</th>
<th>Off-cuts</th>
<th>Peeler Cores</th>
<th>Rounding offs &amp; strips of veneer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential Uses</td>
<td>Increase Recovery</td>
<td>Particle or chip board, Sawdust Briquetting, and Heat &amp; power generation</td>
<td>Furniture Parts, parquet Flooring, Skirting boards, Profile Boards, Broom sticks</td>
<td>Furniture, Parquet flooring, Broom sticks, Profile &amp; Skirting boards, Finger-jointed products</td>
<td>Lumber, Posts</td>
<td>Plymilling</td>
</tr>
<tr>
<td>Plant/Equipment Required</td>
<td>Optimal log positioning equipment, Thinner saw blades, Sophisticated saw tensioning equipments, Training for Workers</td>
<td>Particle board plant, Sawdust briquetting plant, Boilers that can use sawdust for cogeneration</td>
<td>Kiln drier, Rip saws &amp; resaws, Moulding Machines</td>
<td>Kiln drier, Finger-jointing machine, Ripsaws &amp; resaws, Moulding machines</td>
<td>Kiln drier, Gangsaws, Chemical treatment plants</td>
<td>Plymilling Plants</td>
</tr>
</tbody>
</table>
Potential Areas for Investment

It was said by representatives of many of the companies interviewed that their business directions will be aimed at downstream processing. In fact, it was felt by many that in the next 2-5 years, a variety of their downstream products will be significant components of their product offerings. Given the opportunities associated with the manufacture of the below named products and others, it is wise that this process be continued and accelerated.

i. Thinner Saws
Thin blade technology has enabled thinner saw-blades to be produced. These saws results in less waste than conventional blades. They have been found to reduce cutting times and also improve product output by more than 32% in some cases (Krilov, 1988). These saws have been used successfully in the industrialised countries, however they are yet to be adopted in Ghana.

ii. Optimal Log Positioning
The orientation of the log on the bandsaw carriage influences the magnitude of waste generated. Log turning and positioning in more advanced countries is done by sophisticated equipment to reduce waste. In Ghana this is done by the operator of the headrig. To reduce waste, acquisition of log positioning equipment or training of operators on orientation of different shapes and sizes of logs would be required.

iii. Circular Saw Tensioning
Saw tensioning is used to raise the critical speed at which circular saws can operate. In Ghana it is done through hammering and roll tensioning. But in the industrialised countries more sophisticated and accurate saw tensioning methods are used, these have however not been introduced in Ghana.

iv. Particle/Chip Board Manufacture
The process, involves converting the residue into flaky form and then bonding and pressing into sheet form. Special equipment is required for this process.

v. Sawdust Briquetting
This technology is an environment–friendly way of dealing with waste and producing simultaneously useful fuel. Briquetting has not been very popular in Ghana. The only plant that was established in 1984 closed down five years after establishment due to management problems.

vi. Heat and Power Generation using Residues
Most mills in Ghana already burn their solid wood residues in boilers to produce heat for their kiln driers. Increasingly, a good number of mills are beginning to use their sawdust as well.

vii. Kiln Drying
This is done to obtain stronger material, which is more resistant to biodegradation, machines well and takes finish better than the wet wood. It involves using either steam
or hot water to produce thermal energy to dry wood products kept in an enclosed chamber.

viii. **Finger Jointing**
A finger-jointing machine turns shorts and small pieces of wood that would have been termed and treated as waste in the industry into usable or exportable products. The process involves juggling, gluing and jointing.

ix. **Moulding**
This is a downstream processing operation that could make use of pieces of wood that would have been wasted and used otherwise in the wood industry. The process involves rip sawing into smaller thicknesses, bundling, kiln drying and then moulding the wood to specific designs required.

x. **Plymilling**
Log recovery from only veneer production is usually lower than when it is integrated with plymilling. This is because veneer which otherwise would have gone as waste is secured for plywood production.

It should be noted that apart from the financial constraints limiting the establishment of some of the above ventures, some of the major constraints are lack of local skills and technical back up and lack of packaged information on new technologies and products.

**Output 1.3: Policy, Legislative and Socio-Political Frameworks for Sustaining the Resource Base and Investment Inflows into the Timber Industry**

The forest sector is characterized by past policies that have not worked. Major indicators of such policies include over-harvesting by the wood industry, a “growing but not developing industry, high levels of inefficiency and low timber pricing. These indicators are buttressed by an environment of discretionary allocation of timber resources amidst large amounts of uncollected stumpage. Over 20,000km² of forest lands have been allocated under this approach while government has made commitment to use market instruments to allocate resources but there is potentially not more than 4,000 km² of forest land to be subjected to this market approach. The Forestry Commission, which carries a mandate to manage and regulate the forest, is unable to constrain industry and establish a control procedure for monitoring harvest and relating it to the industry’s wood flow. A log tracking system has been conceived, but will require industry participation to work. Presently these adverse conditions have served to widen MLF’s 1996/2020 Forestry Development Master Plan.

**Activity 1.3.1: Review existing policy and legislative instruments on timber industry and identify factors shaping policy and practice**

**Introduction**

There has been a history of political pressure (and wood industry lobbying) to promote the expansion of the industry. Implicitly, however, the government forestry services
(previously the Forestry Department, now the Forestry Commission) have been compelled to relax the official log harvest in order to satisfy increased demand, and a range of policy and legislative instruments have been introduced to ‘square the circle’. The objective of this activity is to review existing policies and legislative instruments on timber and to assess factors shaping policy and practice in terms of relevance, efficacy, sustainability and institutional development.

**Methodology**

The basic methodology adopted was a desk study, which included literature search and review of previous studies. The 1994 Forest and Wildlife Policy, 1996 Forestry Development Master Plan, Forestry Commission (FC) reports, Ministry of Land and Forestry (MLF) reports and other relevant documents were reviewed.

**Findings**

**Current forest policy**

Loss of forest cover in Ghana largely results from two sources. The first is attributed to over-harvesting by the logging industry. The discretionary allocation of resources and concentration of timber interests have also contributed to the wood industry’s resistance to “change.” The second consists of illegal chain sawing, whose contribution to harvesting approximates the annual consumption of the formal wood sector and is currently a threat to industry’s own sustainability.

This latter source was estimated in 1985 to be about 6 times the depletion by the logging industry.\(^1\) It consists of multiple land use practices that are carried out at a lower opportunity cost (loss of forest cover). This is a direct result of past log export ban policies that depress domestic log prices and prevent local people from realizing the real value of the resource. Whatever forest revenue is collected is also inequitably distributed, forest owners being the losers (Birikorang, 2001).

The outcome of wrong forest policies can be summarized as follows:

- **(a)** A decline in the resource and a “fixation” of processors to a limited range of species;
- **(b)** A shrinking pure logging sector brought about by a concentration of market power in the hands of logger-processors and a consolidation of the tertiary sector as a result of the absence of a consistent policy towards development of value-added wood processing;
- **(c)** An inefficient wood industry thriving on protection; and
- **(d)** A decline in investment largely resulting from industry’s current unfavourable perception about the resource availability.

Illegal chain sawing is a resource dissipating activity that takes place with the active or passive involvement of local people and is a symptom of poverty. Forest owners and forest-fringe communities, have little incentives to either protect or conserve the forest.

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\(^1\) Ghana Forestry Review, World Bank Working Papers; November 1985
Forest policy reforms

The Government's NRMP seeks to promote and strengthen public and private sector efforts to achieve socio-economically and ecologically sustainable use of national land, forest and wildlife resources through, inter alia, improvement in the policy and regulatory environment for high forest management and timber industry development, as well as enhanced local community involvement in sustainable management of land and forest resources. Under the programme, a number of policy and institutional reforms have been proposed, to promote sustainable forestry practices and to facilitate a private sector-led plantation development programme. Little progress has been made in policy reforms, the Forestry Commission is now attempting to launch its debut allocation of natural forest (timber) resources through competitive bidding.

The reforms envisaged requires a rationalization programme that brings about a consolidation of primary milling and provides opportunities to firms possessing industrial capacity that can yield higher returns and encourage innovative processors to deliver desired results. Essentially, the rationalization will demand elimination of waste (and release of resources) and to provide investment opportunities to innovative and competitive enterprises. This can come about from competitive bidding in the allocation of timber resources, introduction of log and lumber export quotas and other fiscal measures.

Activity 1.3.2: Assess the extent of industry participation in policy formulation and decision-making and identify the constraints to effective participation of stakeholders

Introduction

Forest policy reform process largely precludes the private sector. The practice is also encouraged by the existence of weak trade associations. This activity focused on reviewing the policy formulation process and identifies constraints to the effective participation of stakeholders, including timber industry and local communities and formulates a process for review, which could be incorporated into project design.

Methodology

Consultations were held with ten individuals in policy-making positions in both the FC and MLF. In addition fifteen managing directors and fifteen forest managers of randomly selected mills were contacted for their views. The selected mills were made up of ten small-scale mills and five large-scale mills.

Findings

The old order is characterized by a public sector domination of policy formulation process. Policy formulation is largely undertaken in consultation with the agencies that regulate the industry and little with the Industry. The Industry has complained about policy makers coming to it with a fait accompli. This happens when government presents
policy measures for industry’s reaction. Policy rationales and strategies are seldom discussed at industry levels. In the last three years, some attempts have been made subjecting policy reform initiatives to consultation with industry through staged-workshops where industry concerns have been noted.²

There is also the opportunity offered by the legislative process that invites industry inputs prior to the passing of Parliamentary Bills into legal enactments.

But some key players in the tertiary sub-sector strongly criticize government for not consulting it on policy that affects the entire sector as well as their specific area of business. They believe this explains what they also consider as unstable policies. Thirdly, they believe policy-makers themselves are not clear on what value added production they seek to promote. The lack of understanding among tertiary operators themselves of the economic policy relevance and requirements of value added processing is also a contributing factor to the absence of entrepreneurial initiatives. To date, there is only one success story in furniture component exports.

A major constraint to the missing link between policy makers and industry is the weakness of the various trade associations. This causes their relegation to the background by policy makers. Industry’s understanding of consultation is extension of policy discussions to a wider section of the industry where, from the judgment of the current study there are presently no identifiable focus groups that can relate to public sector technocrats or politicians. Whatever effort industry has done is based on lobbying.

Efforts to bridge these gaps are being made at two levels: FC’s initiatives, with international donor assistance, at involving industry in instituting a competitive bidding process in the allocation of timber resources (timber rights); establishing an industry forum to review wood sector taxation; and bringing industry on board to implement a log tracking system; and broadening the network of participation in policy formulation by all stakeholders, developing and implementing the process.

Activity 1.3.3: Identify issues that need to be addressed to reform the timber industry and make it more investor friendly

Introduction

Wood industry organizations are largely export-oriented and their organizational set-ups are made to suit how the export trade is organized. This arrangement has bred inappropriate organizational attitude and cultures. Organizations are not effective because they have not been able to adapt well to their external operating environment. These weaknesses manifest in their wrong adaptation to government decision-making; relegation of labour issues to an already weak trade association; improper strategies towards addressing forest community issues; organizational set-ups not well geared towards engineering controls and hence weaknesses in absorbing and organizing around improved technology; lack of interest in market promotion; etc. This aspect of output 1.3

² The Ghana Wood Industry and log Export Ban Study adopted this consultative process.
identified issues that need to be addressed to strengthen and integrate the utilisation and conservation of forest resources.

**Methodology**

In addition to insider information managing directors of five large-scale mills and ten small-scale mills were consulted for their inputs. The mills were randomly selected.

**Findings**

Issues identified under this study as having relevance for reforms and the investment climates are the following:

There is a strong sentiment of indigenization of the timber industry that comes into conflict with commitment to pursuing economic goals that improve welfare and livelihoods of the country’s citizens;

Absence of property rights affects interests of prospective investors to develop the forest resource, create a competitive domestic market for timber as a tradable commodity, and thus provide a sustainable base for the future industry;

Plantation timber development must satisfy the criterion of economies of scale to be economically attractive to both investors and the future sources of demand. The critical requirements are finding easy access to land and establishing an equity principle to govern benefit sharing;

The industry is over-protected and this makes the future of the industry uncertain. State patronage of the industry will always preclude entry of new investors through maintenance of the current operating environment that protects industry. Interview with some industry owners reveal a resentment of new entrants, particularly with regard to the issue of implementing competitive bidding procedures in the allocation of timber rights.

The investment laws and the Timber Resources Management (Amendment) Act (Act 617) are not adequate for developing the strategic investment sought under the Amendment Act. There is no reference to the relative size of investment that may be required at the various levels of industry integration to ensure a combination of efficiency and increased employment at the sector level.³

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³ Future investments in secondary processing of lesser-used species and plantation timber are noted to require higher capital intensities because of processes embodied in modern technologies. Logging and tertiary processing sub-sectors could be subjected to a wide range of capital-labour combinations, so that future prospects of employment generation may largely be concentrated in tertiary processing. See, USAID/ACE: Financial Studies (Technical Report No. 4); Gene Briksong, December 1997
The identified constraints of the timber industry are hindering the growth of the industry. Few new foreign direct investment firms are entering the industry and apart from the secondary processing sector, existing firms in the primary and tertiary sectors are collapsing. These constraints are also in a way protecting existing saw millers, which have resulted in inefficient production and over-capacity in the industry. Long-term industry prospects are not positive and economic and social implications for the economy are not positive either.

Activity 2.1.1: Identify investment constraints and formulate a scheme for incorporation into project design

Introduction

The need for adequate level of investment in the timber industry cannot be over-emphasised. Investment is the main driving force behind the growth and development of the industry. However, the timber industry is beset with a number of problems, which is making investment in the industry unattractive. The aim of this activity is to identify the investment constraints in the timber industry, including both actual and proposed investments.

Methodology

The limited interviews with some industry participants, reviews of previous studies in the industry, pronouncements of government officers, industry regulators and other stakeholders were used to achieve the aim of this activity.

Findings

The following key constraints of the timber industry have been identified:

- Dependence on the exploitation and marketing of few prime timber trees. The small number of species that are commercially exploited tends to make profitable logging and sustained yield management difficult to attain. Currently only about 7% of trees in the tropical forests of Ghana are being exploited. In 1990 over 70% of timber exported was from only two species (FPIB, 1991). The restriction of exports to a relatively small number of species may be attributed to the fact that most importers from the consuming countries are reluctant to utilise lesser-known species from Africa probably because of the availability of adequate supplies of the more established species from a variety of African countries (Agyeman et al., 1997). The promotion of lesser-known species in the domestic market should vigorously be encouraged as a first step to creating their awareness.

- Uncertainties over raw material supply. Though the government has initiated series of measures including a ban on export of logs, introduction of annual allowable cuts, ban of illegal chainsaw operations, allocation of logging permits
and timber utilisation contracts, ineffective implementation of these measures has led to actual harvesting of timber being more than three times the allowable cut throwing doubts over sustained raw material supply. Some of these administrative controls have been challenged by few studies (Wood Industry Study, 2001) as rather contributing to these uncertainties and should be replaced by market based instruments.

- Inadequate well defined property rights over raw material base or concessions. The award of timber rights is at present determined administratively rather than by the market. The distribution of concessions has been discretionary just as more lately the distribution of timber utilisation contracts (TUCs). Though the allocation of timber rights based on competitive bidding for concession will clearly define property rights and allow enterprises to undertake long-term raw material planning its implementation has been thwarted by Timber Resource Management Act (1997) and accompanying Regulations (1998).

- Activities of environmentalists in the consuming countries/markets against the use of tropical hard wood timber because of unsustainable forestry management. Major wholesalers and retailers in the EU are insisting that wood products they buy come from "certified" forests. With no certification, Ghana may therefore be cut out of important export markets and this would constrain the attraction of investments into the timber industry. Certification requires that forest utilisation is planned for sustainability and enforced effectively to protect timber and wildlife.

- Interferences by communities and traditional rulers over concessions granted to timber firms because of their inability to participate in any allocation and management of the forest resources,

These constraints have influenced the entry of new enterprises into the timber industry. Foreign direct investments registered at the Ghana Investment Promotion Centre between September 1994 and June 2003 produced only twelve (12) enterprises for wood processing activities.

The above discussion raises a lot of issues and questions, which need to be clarified and assessed critically at the main project stage. Key issues/questions raised are the following:

1) If lesser-known species are not acceptable on the international market, what has the industry been doing to promote these lesser known species on the domestic market? Is it not possible to design innovative products with the lesser known species and promote them on the international market?

2) Why are administrative controls of ban on export of logs, ban on chainsaw operations and others not working? Are the factors that formed the basis for such policies still relevant? Were implementation issues considered at the policy formulation stage? Are evaluations of policy implementation done periodically to
assess implementation results? Are institutions enforcing these controls adequately resourced? Will market based instruments solve these problems? What has been the international practice and any lessons to be learnt?

3) Do we actually know the stock of timber species? What factors went into determining the current Annual Allowable Cut (AAC)? Do the assumptions (if any) that went into arriving at these limits still relevant?

4) Why has the industry not been able to undertake certification of forests if that is a major criterion to satisfy environmentalists? What about plantations development? How does the industry view plantations development for sustainable investment? Should this be done by industry or by the government? If by government what should be industry’s role?

5) Will the introduction of competitive bidding process solve the property rights issue to enable enterprises take a long-term view for sustained investment?

6) What should be the roles of communities, chiefs, district assemblies and other stakeholders in the forest management process?

7) With all these industry constraints, why new investment in the industry?

8) Is there a case for the review of the structure and functions of regulatory institutions? How are their performances monitored and assessed?

9) What fiscal and financial incentives are needed for foreign direct investments in the timber industry.

Activity 2.1.2: Outline the strategic nature of investment appraisal decisions and assess their impacts on the development of the timber industry

Introduction
The Discounted cash flow methodologies of Net Present Value (NPV) and Internal Rate of Return (IRR) are the preferred methodologies for investment appraisal decisions. For projects that will require bank financing, enterprise debt servicing capacities are assessed using the ratio of EBITDA/(Total Interest + CMLTD), where EBITDA is earnings before interest, tax, depreciation and amortisation and CMLTD is current portion of maturing long-term debt.

Also for investment appraisal decisions, sensitivity analyses are very important. The base case results for NPV, IRR and debt service coverage ratios are made sensitive with changes in key variables like cost or income and the results analysed. The sensitivity analyses are made to capture the uncertainties inherent in the cash flow projections of key variables of incomes and costs. The objective of this study is to identify factors influencing investment appraisal decisions and assess the impact of investment appraisal decisions on timber industry development.
Methodology
The main methodology adopted for this study is a desk study, which included literature search and review of previous studies. Key factors influencing investment appraisal decisions were identified and discussed through interview with some industry participants.

Findings

Factors Influencing Investment Appraisal Decisions

Key factors influencing investment appraisal decisions were discussed during the limited interview we had with some industry participants. These include the following:

- Macroeconomic indicators like inflation, interest rates and exchange rates.
- Market analysis for products. Analysing both domestic and international market dynamics is an essential component for any investment appraisal decisions.
- Product design and product quality
- Industry competitive structure
- Pricing and product demand patterns
- Technological changes within the industry.
- Resource requirements and costing – raw materials, labour, energy, utilities, technology, transportation, etc

These factors will form the basis for determining cash flows and the firm’s opportunity cost of capital or the discount rate for the investment appraisal decisions. The determination of the firm’s opportunity cost of capital or the weighted average cost of capital or the discount rate is very important for capital budgeting exercises. The factors, which go into such determination, include the firm’s capital structure in-terms of debt and equity ratio, cost of debt and cost of equity. Determining cash inflows and outflows may sometimes demand the use of simple economic and financial models.

Investment Appraisal Decisions and their Impact on Timber Industry Development.

Investment appraisal decisions based on discounted cash flow methodologies will have the following impact on the timber industry

- Investment decisions will be based on tried and tested methodologies that have world wide acceptance. Selected projects managed efficiently should therefore contribute to wealth creation.
- The use of these methodologies will demand staff with good financial management skills. Career development in financial management will therefore be enhanced
- Investments in marginal projects will be dropped and this will allow consolidation within the industry. The industry will therefore benefit from economies of scale
- Development of business strategies will form part of investment appraisal decisions with positive impart on industry development.
- Reduction in business failures of start-up projects in the industry
Through the limited interviews conducted, major factors influencing investment decisions have been identified. What needs to be done is to address the following issues at the main project stage:

- Which of the discounted cash flow techniques are widely used by the industry for arriving at investment appraisal decisions?
- What reasons are assigned for particular methodology preference?
- What qualitative factors are taken into consideration?
- How are cash flow projections carried out?
- Are there economic and financial models for estimating some of the key variables?
- Any analysis of the capital structure of firm as basis for calculating the weighted average cost of capital (WACC)?
- Any issue of optimal capital structure considered?
- What capital market assumptions were made?
- Is the discount rate based on the WACC or the nominal bank-lending rate?
- How are technological changes factored in the projections?
- What has been the performance of projects against projections?
- What levels of debt servicing capacities are arrived at?
- Do we see consolidations taken place within the industry?

Activity 2.1.3: Assess investment impacts and knock-on effects

Introduction
Investments in the timber industry are expected to impact on the industry, the economy, the local communities and on individuals. These impacts could be positive or negative and obviously produce knock-on effects.

Methodology
The methodology adopted included interview and review of previous studies. Twenty industry participants were consulted for their views. The final report of the Wood Industry Study was also reviewed.

Findings
The following were identified during the limited interview process and from review of studies done in this area:

a) Employment. According to the Wood Industry Study, August 2001, the timber industry generated direct employment to about 104,000 people in 1999. Depending on the investment climate and outlook, the identified constraints, the availability of funding and actual investments undertaken subsequent to 1999 the figure could have increased or decreased.

b) Economic growth and development. The timber industry contributes to the overall economic growth and development of the country. Any investment or dis-investment therefore impacts on the economy.

c) Poverty Reduction. Investments in the industry produce multiplier effects at both the national and the local level, which in turn reduce poverty.
d) Community development. Investments impact positively on the community through employment, compensation to local landowners and development projects like roads.

e) Environmental Issues. Harvesting of trees for the timber industry degrades the environment, which has long-term economic and social implications.

f) Corporate governance and management practices. For enterprises to be competitive and remain in business, good corporate governance and management practices are to be employed so as to manage scarce resources efficiently. The management function is key in every organisation and the timber industry is no exception.

g) Technological knowledge. Efficient enterprises in the industry are managed by technology. Product development, product design and processes are done on technological platforms. Technological knowledge transfer will therefore be one of the by-products of investments in the industry.

h) Plantation development for sustainability. For the industry to be sustainable, plantation development should be encouraged by industry participants by granting property rights on concessions for that purpose.

i) Capacity building and human resource development. Human resources are key inputs in the production process of the timber industry. For industry investment to be sustained capacity building and human resource development should be recognised and addressed as a strategic issue.

Investments in the timber industry will obviously generate impacts and knock-on effects on the economy. Issues identified will be assessed critically by raising the following questions at the main project stage:

1) What have been the changes in direct employment of the timber industry over the last decade? What have been the causes of these changes? Any concentration of these changes? In order words what have been the geographical distribution of these changes?

2) Any relationship between employment changes and poverty at the community level? Do investments actually reduce poverty?

3) Do we see investments contributing to human resource development and capacity building? What is the relationship between investments and human resource development?

4) Are technological knowledge and know-how being transferred? What is the staffing structure of enterprises in the industry? Are Ghanaians in key positions to acquire technological knowledge and know-how?

5) What have been the impacts of investments on corporate governance and management practices? Are management structures flexible enough to allow middle level management staff to contribute to the effective running of enterprises? Do we have effective Boards in place for enterprises in the industry and how are their functions discharged?

6) Do we have a culture of preparing business plans and annual budgets? Where budgets are prepared what are used for, control purposes, planning, etc?
7) Any long-term strategies for enterprises in the industry? Any plantation development strategy for investment sustainability?
8) What are the policies concerning environmental issues? Are enterprise policies implemented and do they conform to national environmental policies?
9) What has been the trend of the contribution of the timber industry to national growth and development? What has been the trend for export earnings from the industry?

Output 2.2: Timber Industry Capacity Needs and Institutional Requirements Analysed

One of the most important problems that the forestry sector in general and the timber industry in particular has been grappling with for a long period of time is the issue of an appropriate institutional structure and arrangement to facilitate sustainable timber industry development. The activities of some institutions, which impact on enterprise development in the timber industry needed to be assessed in terms of their existence and operations and how these impact on the enterprises in the timber industry.

Activity 2.2.1: Undertake strategic analysis of timber industry performance

Introduction
This activity presents the synergy of the policy-industry strategy correlation. It is intended to enhance a better understanding of how policy makers and enterprise managers can contribute effectively to decision making and management control that will lead to efficient enterprise development and business strategy formulation and implementation.

Methodology
Industry perceptions about policy and sustainable forest management were analyzed through discussions with key industry players. Strategy options adopted by the wood industry in the light of these perceptions were also examined through a desk study.

Findings

Industry perception about policy and sustainable forest management

The strategy pursued by wood processors is best analyzed in the context of Ghana’s past forest policies. The question that arises is why the restructuring sought under Ministry of Lands and Forestry’s Forestry Development Master Plan (1996/2020) did not happen after the launch of the plan in 1996. Corporate decision-making in the post-timber ERP era typically took a short-term reactive stance that followed wrong signals. A 1997 observation made by the GTMO was that the wood industry was accustomed to reacting to short-term, erratic forest policy. One key industry player sought a consistent forest policy, even if it was a bad one. This perception was echoed in the September 2003
discussions with key Industry players. Primarily, however, there was an over-concentration of interest in availability of wood fibre, a number of investors citing recent cases of relocation by Ghanaian companies in Gabon and Cameroon as a result of an unfulfilled promise of raw material supply. One investor considers the easy and multiple access to the forest resource as tantamount to treatment of the forest by government as a “communal good”, with little regard to the importance of property rights. This appears as a threat to future investments.

Industry strategy

Against this background, this study observes the following as the strategic options adopted by the wood industry:

a) Comparisons of trends in investments in the forest industry and log production suggest that industry investment decisions have been largely influenced by its perception about the availability of the raw material.

b) There is an observed phenomenon of “substitution of logs for capital.” Industry opts for an increase in output from increased timber production rather than improving efficiency through innovation. It also tends to respond more to profit rates per unit of log input. This “return on business” reckons with excess profits;

c) There is an industry aversion to training and upgrading of supervisory staff to managerial grades. This attitude matches with a strong preference for direct recruitment. Enterprise owners perceive such training to have high risks as a result of the practice of personnel “poaching” in the industry; and

d) The total absence of joint-venturing, mergers or similar corporate strategies in an environment of dwindling forest resources.

Influencing policy measures

A diagnosis of the business decision-making brings the following policy measures into sharp focus:

(a) Log export ban and discretionary allocation of resources: This has caused industry to seek integration of logging and processing. The outcome is a sharp shift in market power from small-scale loggers to integrated logger-processors. In 1999, the latter controlled about 95% of the domestic log market.
Graduated levies on AD lumber exports: The structure of these levies has the inherent weakness of not being progressive enough to avoid an over-concentration on now endangered primary species.

Exemption of kiln-dried lumber from levies: The Ghana Wood Industry Study observed and estimated an over-sizing of 18% in the processing of Lesser-used species that resulted in high cost of processing. Enterprises took short-term decisions in establishing kiln-drying facilities without adequate preparation for technically managing kilning schedules. Some companies are hiring expatriate kiln drying experts at a high cost, and would substitute employment of trained Ghanaian counterparts if available.

Inappropriateness of overall policy: The Ghana Wood Industry Study illustrates a contrasting expansion (almost a doubling in numbers in veneer and plywood production and a more than proportionate increase in product lines) against a downsizing of all other levels of integration, the cases of small-scale logging and tertiary operations being more distinct. The biggest problem facing both loggers and tertiary operators is that of short-term cash-flow, while secondary processors have generally had a greater urge in appropriating or wasting economic rent; and

The case of a continued industry concentration is also established, a small segment of the industry dominating the trade. In 2002 10 leading companies accounted for over 50% of total exports and the first 20 about 60% out of about 120 surviving industries.

Combined impact of policy and industry operational stance

(a) Low level efficiency: Industry re-structuring expected in the 1990s generally did not happen, but vertical integration did occur within the large scale (or leading exporting) companies. The sector still remains inefficient by international standards. This conclusion is supported by the record of processors being leading log exporters in the first half of the 1990s. Processors, by implication, considered themselves less competitive compared to their international counterparts. (GWV, 1997). This position is consistent with industry’s reaction to the question of why processors are unable to pay close to the “international” price of logs. Industry’s reasons in all cases bothered on an assumed yield (recovery factor) from which production cost is

(b) One company in Brong-Ahafo was among the leading exporters in the late 1990s, its contributions coming from Air-dried Odum lumber exports, that generated reasonable amount of surplus, compared with other relatively lower-leved species which were highly unprofitable to produce and export. Today’s scarcity of odum, particularly in the region locating the country’s leading furniture exporter with the best alternative use of the resource, reflects the high social opportunity cost of the former company’s exports.

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assessed. Thus, low yields resulted in high production costs. Under conditions of log export ban, these high production costs co-existed with low domestic log prices.

(b) Existence of a high economic rent: A timber technical audit study undertaken in 1993 sought to recommend strategies for bringing the wood industry’s capacity in line with the regulated harvest level (GWV, 1993). Fiscal measures applied in subsequent years (1993-97) through stumpage and export levies to regulate industry capacity did not work, as the log export ban compelled independent loggers to absorb the tax incidence and export levies were irrelevant to domestic sales of plywood that became increasingly important. Thus, the State failing to recover a high amount of economic rent that has largely shifted to processors, a significant proportion of it constituting wood waste and sale of residues at a low value (G. Birikorang, 2001)

(c) Poor wood utilization: Industry losses turnover from defective sawing techniques and limited middle -level technical capacity, but there has been little innovation across industries to improve labour productivity (Okai, R. 1999; Birikorang, 2001). The operating environment is not compelling, and there is preference for the maintenance of a “business as usual” culture.

(d) It is noted that Industry is fixated to a relatively small proportion of species that account for over 90% of exports. Beyond this, there has been no significant change in the structure of product segments that enter the export trade. Higher valued added wood products had remained around 20% and furniture components, in particular around 1%.

(e) The wood industry paid an additional export levy of 10% on lumber export turnover in 2001 and 7% in 2002. The Ghana Wood Industry Study estimated industry profitability to be 10-15% for the year 1999. There does not appear an inconsistency between this profitability estimate and the phenomenon of industry “hanging on” after the new export levy, which is essentially an “export turnover” tax.  

(f) Cheap chain saw lumber on domestic market, leading to widespread unwillingness of saw millers to sell on the domestic market, but preferring to engage in re-manufacturing for export, often at high economic cost than perceived by exporters.

Activity 2.2.2: Identify the capacity needs of the timber industry and outline a strategy for incorporation into project formulation to address the needs

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Some investors claimed they subsidized operations in 2002 by about £600-700,000 (about US$1,000,000 on the average) after government imposition of a 10% National Reconstruction (Export) Levy in February 2001. This taxed total export turnover, not gross profits. The Ghana Wood Industry Study, however, estimated an average fob price of US$ 154 for Pink Star species and average domestic price of US$45 for such species in 1999. The Study also estimated an amount of approximately $18 million accumulating to industry as economic rent, compared to a total stumpage collection of some $6 million.
Introduction

As indicated by activity 1.2.1, the timber resource base is not enough to support the timber industry. This presents a challenge to the timber industry. Among other things the timber industry needs to improve upon it capacity utilisation to meet the challenge posed by the scarcity of timber resources. The objective of this activity is to identify the capacity needs of the timber industry and outline a strategy for incorporation into project formulation to address them.

Methodology

The methodology adopted is basically a desk study. In addition results of previous interviews addressing similar issues were also reviewed.

Findings

Organizational level limitations

The wood industry is primarily export-oriented. So its organizational structure is designed largely to meet its export objectives. At the organizational level, enterprises can be categorized into the following three distinct organizational types:

(a) The market-oriented- This type of organization concentrates decision-making at the top management level where knowledge of specifications and preference of the end-user of its products is well-known and documented, and the relevant market criteria enter its operational planning, production, engineering and costing. Ten companies, - nine in the secondary processing category and one in the tertiary have such organizations. The nine secondary processors fall into three “conglomerates.”

The organizations have a core competent technical staff whose competence, however, is adequate only under industry’s current operating environment. Rationalized timber pricing, transparent regulation of access to the resource and limited availability of traditional species are challenges that staff of most of these organizations will face in minimizing unit cost of log input, a major determinant of future competitiveness.

They have the ability, to some extent, to arrange off-shore corporate or capital financing.

(b) Buyer-focused – This type of organization keeps a horizontal relationship with a limited number of traditional buyers. Very often the buyer’s roles are limited to providing information on market trends and supplies’ credit to the local company. The organization however internalizes operational controls with the help of middle level managers. In one instance observed, the organization has established a record in promoting 4 species (koto, bonsamdua, kyenkyen and celtis)
The top hierarchy of these organizations is skill-intensive, but they have a weak middle level management that they have internal trained limited staff to strengthen.

(c) **Contract-driven** – A large number of enterprises, virtually all small scale secondary processors and selected number of other scales of operations belong to this type of organization. Decision-making is jointly exercised by the top hierarchy and middle-level production management. The business objective is primarily to attain “volumes.” The organizations are exposed to a wide range of buyers and are very often engaged in production in anticipation of letters of credit from a buyer who has expressed interest. Buyers or their local representatives sometimes provide technical advice on production and grading.

The contract-driven organizations by definition are not market-oriented, and have the conventional broad-based hierarchy that is characterized by a large number of staff with limited formal training. These organizations have financial constraints and are unable to retain staff after training. A number of firms now engaged in “custom-cutting for other exporters have only recently fallen out of this category.

Generally, the organizational structure of the forest industry is tailored to meet a narrow scope of organizational strategy. It has been geared towards the export market conditions, rather than been adapted to its total operating environment. Distinctly in the periods 1970-1984 and 1996 the scope was limited to the domestic macro-economic conditions under which currency over-valuation favoured importation and over-invoicing and export and under-valuation. Today’s constraints of equipment obsolescence, limited professional and semi-professional skills, excess capacity in kiln drying characterized by non-economic scales are due to this narrow scope of organizational strategy.

Against the future operating environment articulated in this study, the following weaknesses are assessed at the industry organizational level:

(a) Adapting to government policy decision-making: Organizational decisions are concentrated at the top hierarchy and options are scarcely discussed downwards. Managing Directors do not attend government workshops, but will send subordinates who do not take investment decisions. WITC also trains such categories of mill personnel.

(b) Labour issues: These are usually pushed to an already weak trade association. Management only complies with global collective bargaining agreements with labour. For a large number of organizations too, there is an unwillingness to invest in training.
Community issues: A limited number of firms have succeeded in building a social acceptability. Most firms, comprising largely the small-scale loggers and small mills, however, are either denied social approval or have to incur high transaction costs for poor strategies.

Technology: Modern technologies require new organizational structures that emphasize engineering controls and high levels of production and management skills to meet market criteria of pricing, quality, and delivery. These conditions are largely missing among Ghanaian industries.

For most firms, the organizational culture creates an inability or lack of interest in market promotion. The EU-WSDP has similar impressions.

There is widespread over-concentration of industry strategy on log procurement and pricing.

These weaknesses do explain the lack of a general response to MLF’s Forestry Development Master Plan, and specifically, inability of the sector to expand contribution of high value added products in production and exports and most exporting firms remain price takers. The result is weak competitive positions among the wood industry.

Operational level limitations
The culture of any organization determines the rules for management. The culture of organization embedded in wood sector enterprises generally explains the existence of the following operational weaknesses:

(a) There are limited skills in the selection and application of logs and intermediate wood products of varying grades to processing specific end-use products. This mainly results from the limited market opportunities available to the organizations. Market opportunities provide signals for enterprises to develop such skills as may be necessary to sustain enterprises’ competitiveness.

(b) There is a general lack of professional control in supervision of shop-floor production to bring about waste reduction and conformity to standards. Many mill supervisors lack technical qualifications and have only long period experiences learning and developing routine skills on the job. Transfer of skills is not conducted on a systematic basis and there is no focus on fundamental processes and their horizontal linkages. For example, in many firms, power ratings of motor drives and bench feeding techniques when unsynchronized in thoughts do cause burning of electrical motors and long stood-down time; better re-sawing can lead to better grading results, provided green chain (cross-cutting and tallying) procedures go with skills for maximizing grade volumes.

(c) There is little challenge in industry from process control requirements. The existing limited professional wood technologists and scientists in industry do not have the minimum exposure to improved technology and their blueprints on
processes to meet future objectives of increasing value added production and marketing. The generally poor control of kiln drying processes in industry and its adverse impact on production cost and the occurrence of “blisters” on sliced veneers in *Celtis* species are some examples.

(d) There is a lack of marketing skills among many firms.

(e) In many firms, weak technical skills for managing mill infrastructure affect costs and competitiveness; and,

(f) There are limited internal financial data generation (including costs) and management, as well as business planning skills.

**Activity 2.2.3: Identify institutional constraints to timber industry development and analyse institutional requirements**

**Introduction**

To ensure adequate development of the timber industry the government of Ghana put in place a number of structures to regulate the industry. However, these institutional structures have some weaknesses, which need immediate attention if we really want the industry to grow. The aim of this study is to identify institutional weaknesses in the regulation of the forest industry and analyse industry’s institutional needs.

**Methodology**

Insider information, literature search and interviews were used to achieve the aim of this activity. Ten individuals in policy-making positions were consulted for their views. Previous studies were also reviewed. Twenty tertiary operators were also interviewed.

**Findings**

The Forest Administration regulates the wood industry directly and indirectly through the following institutional structures:

*The Forest Service (FSD)*

FSD regulates the annual harvest through administration of a quota system introduced since 1997. But FSD’s Annual Allowable Cut (AAC) regulation is a long-term concept that is only relevant at the end of the felling cycle. The AAC also bears no relationship with markets for timber and wood products. The short-term annual quota is also unenforceable, FC staff having little commitment to do so.

Forest management regulations are implemented in the field largely by technical grade staff. The absence of adequate professional staffing poses a constraint to FC’s decentralization and district level strategic planning. Monitoring is consequentially weak,
while capabilities for complying with internationally auditable procedures are also limited.

The annual harvest quota system and monitoring, therefore, largely remain unmanaged, while the issue of salvage and other permits makes monitoring an overwhelming task. These conditions have provided recipes for increased harvesting.

There is a high level of arrears among timber operators in stumpage payment. This is largely due to lack of commitment of FC staff to collect revenues due and weaknesses in the administration of the debt account. The collection rate averaged 60% in the 1990s, but presently may be considerably lower as a number of important timber revenue sources are recording collection rates of 30%.

**Timber trade regulation**

The Timber Industry Development Division (TIDD) of Forestry Commission is mandated to carry out enterprise registration, vetting of export contract prices, inspection and quality control, industry training, market intelligence and export promotion. It is also required to register buyers and their local representatives. Within this span of functions, the Division lacks the capacity to conduct quality control or enforce standards, while its export promotion function has been performed poorly due to inadequate scope and content of its planning. TIDD grading and inspection staffs sometimes encounter highly experienced mill graders and consequently suffer from low level confidence.

Results of interviews and administration of questionnaires among tertiary operators suggest that the role of quality control is that of Industry and not TIDD. TIDD’s commercial functions that regulate their marketing are also areas the Division’s role is considered irrelevant. Previous export promotion efforts made by the former Timber Export Development Board ended in disappointment, as industry was unable to meet orders. The EU-WSDP notes a lack of international marketing research and promotion among finns; a serious lack of marketing information and little understanding of the need for it. TIDD has not been able to fill the gap of marketing strategies, plans and market research.

As part of its policy of liberalizing trade, Ministry of Trade and Industry (MoTI) is keen to see similar developments in the forest sector, particularly, as it considers the flow of forest products and related transactions outside the forest gate as part of “domestic trade.” Both UNIDO and AGI have reviewed the forest sector trade and institutions and reached similar conclusions.

**Research**
Forestry Research Institute of Ghana that carries a mandate to carry out research is under-resourced. The institute is presently more vertically inclined in its research programmes driven by the general institutional requirements imposed on research personnel.

**Training in skills**

Wood Industries Training Centre (WITC)'s training programme concentrates on lower grade staff than desired by Industry. This is mainly due to WITC’s limited professional staff levels (Birikorang, 2003). It is reported that industry is not keen on paying even the small fees charged by WITC because they have questioned the qualifications and expertise of WITC (WSDP, 1999). The center’s installed equipments are also not up to date. WITC should be a step above Industry, but the reverse is the order.

Training facilities employed by tutors in current training at polytechnics are unsuitable for quality training. Further, the specializations the polytechnics administer fall below standards required by the wood industry and WSDP has even questioned the HND qualification in furniture. Above all, tutors lack motivation and are also out of touch with industry requirements

The present conditions of both WITC and polytechnics limit their absorptive capacity for any appreciable capital budget. The European Union probably does not feel attracted to committing such capital budgets contemplated by the Wood Sector Development Project to WITC essentially because it remains a public institution where programmes are supply-driven (that is targets are based on sheer total numbers trained) dependence on public budget is the rule (Birikorang (2003).

**Investments approval**

The Ministry of Lands and Forestry (MLF) attributes lack of control of investments in primary and secondary processing partly to the GIPC’s previous exercise of autonomy in the extension of incentives and benefits to investors in the forest sector.

The Timber Resource Management (Amendment Act), Act 617, now requires FC’s prior recommendation of any investment in forestry to MLF. But FC presently lacks the capacity and institutional framework to provide investments advice, answer to investors’ questions and to conduct investment analysis and preliminary appraisals.

**Weaknesses of trade associations**

Industry trade associations are weak in many respects and provide virtually no service to industry. They lack suitable organizational forms with suitable professional staff to address both development and operational interests of industry and financial strength. At the industry sector level, there is a complete lack of cohesion with near irreconcilable differences. Devolution of commercial functions by the FC to the private sector is a meaningful strategy, but it begs the question of the readiness of the private sector to play their roles well.
**Industry’s Institutional Needs**

To support future industry development, the institutional reform should meet the following requirements:

**Forest regulation**

(a) The future market will require forest regulation to be more market oriented. Constant review of moving species should be undertaken in accordance with market demand. Species girth limits should be reviewed for a long-term supply trend forecast, giving due regard to research findings on species properties, product engineering requirements and consumer specifications.

(b) Industry has been invited to share responsibility in the installation and implementation of an FC-proposed log tracking system. This will be extension and improvement upon TIDD’s existing log control procedures.

(c) The private sector should be made to assume more sustainable forest management (SFM) responsibilities under TUCs.

(d) Development of criteria and indicators for SFM with industry involvement could lead to convenient industry compliance. This development could provide the basis for developing voluntary certification of industry exports. “Trade-Bloc” negotiation of legal validation of timber could be a phased approach to achieving global certification status.

**Trade regulation**

(a) Quality control is not a job for TIDD. One of the Division’s objectives is to promote standards development and even though this is specified under the FC Act, this function can only be undertaken on behalf of the Ghana Standards Board (GSB), the only Body legally empowered to certify product quality. TIDD will have to work under the general rules and procedures of GSB. But its capacity must be built for that purpose.

(b) Marketing (covering delivery, customer specification and pricing) is a job for companies. Enforcement of minimum export prices through TIDD guidelines is said not to be benefiting many, as aggressive marketing and negotiated prices by some exporters (very often the integrated large scale companies) are sometimes undermined by poor pricing by others (usually small scale exporters). The weak firms, on the other hand, think they need TIDD’s intervention to protect them.

(c) The lack of strong trade associations is a good reason for the price protection argument, usually put forth by TIDD. Under the current forest policy reforms envisaged, namely the introduction of market instruments in determining resource allocation and a properly aligned fiscal system, regulation of prices will be irrelevant. In the medium term, Trade associations should be able to take up that role. In the short-term, a joint Industry-TIDD approach should be adopted in
determining price guidelines. The term “minimum” should be avoided in describing guiding prices.

(d) Timber inspection needs to be streamlined. When policy reforms are accomplished, mill inspection for grade should be reduced from 100% to about 50%. Port inspection should also be based on a volume sample ratio not exceeding 20%. In the long term, a private graders association could be established to take over the role of grading and inspection.

(e) TIDD’s future focus will be in the following areas:
1. Assisting industry with operations research on equipment and appropriate technology, export promotion, market and product development. It should interface between enterprises and research institutions;
2. Collaborating with GSB and develop capacity in conducting standards certification and periodic surveillance;
3. Industry wishes to engage semi-professional and professional staffs who have received practical training, but WITC lacks capacity to deliver these. There are good reasons to support devolving FC of its ownership in WITC and transferring the WITC training infrastructure to industry. The Division will still have a role to play in the transition;*

(f) For FORIG to reduce its vertical inclination to research. The forest industry must encourage the institute to embark on demand driven programmes by identifying priority needs and providing adequate funding.

Investment promotion
This report envisages that with FSD and TIDD sharing responsibility for forest management, trade and industry regulation, FC Corporate Headquarters should focus its attention on promoting investment. For a friendly investment climate, MLF and FC must address the fiscal regime that tends to penalize performance. The following could enhance future strategic investment promotion in the sector:

1. Minimum pricing as a policy should be phased out;
2. Export levies introduced in the 1990s did not influence the structure of product segments and discriminated against exporters, while they favoured domestic production;
3. There must be a scheme under which innovators are rewarded or compensated for the investments they made in developing products, markets and bringing about technical change; and

Investment opportunities are offered under the Free Zones Act, 1995 (Act 504). The wood processing industry is recognized by Ministry of Trade Industry as a potential

*See Wood Industries Training Centre And College Of Renewable Natural Resources: Studies Of Business Options; G. Birikorang, January, 2003
contributor to Ghana’s “Gateway” Project. The Free Zones Act seeks to promote investments that guarantee free movement of foreign exchange resources and involves a virtually 100% deregulated trade and investment environment. It also creates a good environment for employment generation.

Output 2.3: Strategic Review of Timber Industry Development Strategy and Action Plans Done

Faced with diminishing resources, world-wide competition, changing consumer preferences and rising costs, even the most efficient operations can no longer survive the handicap of operating without a clear, strategic direction. A clear strategy must be formulated by enterprises from which effective operations flow.

Activity 2.3.1: Identify timber industry strategy development needs and appropriate strategies to address the needs

Introduction

The importance of strategic planning in the modern-day corporate management cannot be over-emphasised. This activity analysed the financial, operational and export related strategies and risks in the timber industry and outlines the steps needed to be undertaken to implement strategic planning in enterprises, though there could be variations in the detailed implementation process.

Methodology

A desk study was used to achieve the aim of this study. This included literature search, the use of insider information and review of previous study.

Findings

Review of Factors impacting on the Performance of the Timber Industry

The timber industry is exposed to several risks, which threaten the very survival of the industry. The following have been identified as the key risks affecting the industry:

- Raw material supply risk. The fast dwindling of the country’s forest cover not accompanied by effective plantation development programme to sustain continuous raw material supply poses a major risk to the timber industry. The government has now introduced the concept of bidding for concessions on contract basis to ensure that the remaining timber resources are efficiently utilised to the benefit of all industry stakeholders. The granting of property rights to enterprises in the industry will enable them develop plantations to sustain the long-term survival of the industry.

- Threat of tropical timber boycott. Environmentalists and other pressure groups in Europe and America (the traditional market of Ghana’s wood products) have been
waging a campaign against the export of tropical timber products from countries that do not have forest certification programmes. Immediate implementation of the certification programme in Ghana should therefore be a priority.

- Market risks. The demand for wood products is highly influenced by economic growth prospects (especially the construction industry) in Europe and America. For example, the timber industry experienced market recession between 1995 and 1996 due to economic downturn in Europe. Subsequent economic recovery improved the market situation. The industry also suffered from the Asian crisis, which caused prices to drop substantially on the international market.

- Financial risks. Most enterprises in the industry are highly leveraged with weak liquidity and low profitability. Moreover most enterprises use short-term loans to finance capital expenditure for expansion projects. Loan servicing therefore becomes a problem for most of these enterprises. Default rate is consequently high in the industry. More injection of equity is therefore needed at the enterprise level.

- Technological risks. The production process of most enterprises in the industry is handled by old and obsolete machinery. The use of information technology for product design, process engineering, transport management, financial management etc is absent in most enterprises. The result is low recovery rate of output from raw material input and longer processing times with negative impact on production, liquidity and profitability.

- Bush fires. The impact of bush fires on the timber industry is enormous with long-term consequences. Bush fires consume large tracts of forest with numerous timber stocks at various stages of development within a very short time. The result is the rapid depletion of the raw material base of the industry. Bush fires are natural disasters though negligence of human beings contributes immensely to their incidence. Management of bush fires is therefore a collaborative effort with all stakeholders in forest industry.

- Performance risks. Performance here relates to the ability of enterprises to meet confirmed export orders in terms of delivery time, product specification and product quality. Because of obsolete machinery, access to raw materials, product design deficiencies, etc most enterprises are unable to perform major contracts on their own. Again economic instruments like taxes, royalties, quotas, auctions, permits, performance bonds, log export bans, timber certification, etc do contribute to performance risks. These factors in a way contribute to industry credibility with negative impact on long-term industry development.

**Essential Elements to Consider in the Development of Industry Strategic Business Plans during Project Design**

Enterprises in the timber industry will be critically assessed to determine their strategic planning and implementation process in the main project. The following issues/questions will be considered in the assessment process:
1) How are missions/visions formulated in the industry? Does the industry have any underlying philosophies that guide the conduct of industry participants? What time frame does the industry have for its visions and are these linked to the time frame of strategic plans? Do enterprise executives try to own the plans and implement them? Are plans prepared for the sake of meeting some external requirements?

2) For internal analysis, is there the necessary data-base to construct trend analysis? Are staff performance evaluations done to document human resource characteristics, which could form the basis of analysis? What are the installed capacities of plant and machinery? Any element of unused capacity and what is accounting for that? What are the other identified weaknesses? What are the main identified strengths of enterprises in the industry?

3) For external analysis, what are the environmental characteristics that affect the industry? How do the following general factors affect the industry; economic trends, social/cultural changes, political/legislative changes, technological changes, etc? How do the task environmental factors like markets, sources and cost of capital affect the industry? Which of these factors creates opportunities for the industry and which of them creates threats for the industry?

4) What are the expectations of industry/enterprise stakeholders?

5) What are the key issues that need to be addressed? How do you determine these issues?

6) Is there a database to determine the relevant trends that would form the basis for objective setting?

7) How is industry/enterprise objectives set? Any time frame to be attached to these objectives?

8) How are strategies generated? How are they evaluated? What are the bases of selecting from alternative strategies? How are action plans formulated for implementation of selected strategies?

9) How is plan implementation monitored? Any regular reports on the performance of the plan?

**Activity 2.3.2: Hold workshop to discuss project results and way forward for timber industry**

A consultative workshop involving participants from the timber industry and other stakeholders with keen interest in the industry was held to discuss the way forward for the timber industry. The workshop was jointly organised by ITTO pre-projects, PPD...
63/02 Rev.1 (I) and PPD 53/02 Rev.1 (I) Development of Energy Alternatives for the Efficient Utilization of Wood Processing Residue: Co-Generation and Briquette Production (Ghana). The idea for the joint workshop was to enable members of the different ITTO Forest Industry pre-projects being implemented by the Forestry Research Institute of Ghana (FORIG) to formulate and submit to the ITTO a single project proposal addressing most of the concerns of the timber industry in Ghana.

The workshop report has since been submitted to the ITTO by the team leader of PPD 53/02 Rev.1 (I) Development of Energy Alternatives for the Efficient Utilization of Wood Processing Residue: Co-Generation and Briquette Production (Ghana).
3.2 CONCLUSIONS

Over capacity in the timber industry is influenced by low timber pricing and discretionary allocation of resources.

The potential for establishing a sustainable forest for a sustainable industry exist and should be seen in two separate contexts. In the short term, forest reserves will be the mainstay of the timber industry as off-reserve resources are likely to be extinguished within 7-10 years. Forest reserve felling limit is likely to drop from the current 500,000m³ quota to about 300,000m³, as there has been a significant reduction the basal area for high and moderate demand species.

Much needs to be done in the policy, legislative and institutional framework to give the needed support to future investment in the forest sector. Loss of forest cover resulting from both over-logging and lack of interest of forest owners to protect the forest – an underlying factor in the uncontrollable illegal chain sawing – have not been adequately addressed.

Ghana’s timber industry is constraint by a number of factors that include dependence on the exploitation and marketing of few prime timber trees; uncertainties over raw material supply; inadequate well defined property rights over raw material base; interference by communities and traditional rulers over concession granted to timber firms.

The strategic analysis of industry performance presented in this report shows that industry simply responds to policy signals. The policies pursued in the past have primarily caused industry to over-concentrate its strategies on availability of wood fibre. Some key players however, have a long term interest in keeping the resource by sensing a disappointing absence of property rights. Presently, however, Industry’s perception is that the resource is running out and this explains why there is sharp down-turn in investment.
3.3 RECOMMENDATION

The project recommends the following for implementation;

- The efficiency of forest workers and machine operators should be improved through training in working methods and techniques relevant to their areas of operation. Training of operators at all levels is necessary to improve recoveries.

- Plantation development should be encouraged through the provision of incentives to those who invest in them.

- There should be the development of technologies for using lesser-used species. These technologies should be transferred to the industries through training of their operatives.

- The mills should be modernised to process small diameter logs especially, branch wood, peeler cores and lesser-used species, which naturally do not grow to big sizes.

- There is the need for increased forward integration of the processing mills. Since such mills are likely to achieve higher recoveries, because residues from one product line could serve as input for another downstream product.

- There is the need to improve recovery from the forest by backward integration through the establishment of bush mills. But necessary controls should be put in place to ensure that such mills limit themselves to residues.

- There is the need to improve dissemination of information and knowledge relating to new value addition technologies.

- Most mills are inefficient due to obsolete machinery. More modern techniques in processing are required to enhance recoveries. There is therefore, the need for investment in modern machinery for processing as well as value addition.

- A tentative annual estimate of domestic demand of 1,000,000 m³ has been made under this study, and is likely to generate a supply demand gap of some 1.5 million m³ in round wood equivalent. In the short to medium term, this gap will have to be eliminated through imports, substitution of plantation timber and a consolidation of the industry.

The project further recommends the following for future research;

- How best to downsize the wood industry to reduce the capacity of the timber industry

- Evaluation of investment needs and investment sources
➢ Analysis of the market demand for potential products identified by the project for future investments

➢ Analysis of how to promote LUS in both the domestic and international markets.

➢ Impact of administrative controls such as ban on export of logs, ban on chainsaw operations on the timber industry.

➢ Fiscal and financial incentives needed to attract foreign direct investment in the timber industry.

➢ Analysis of the capital structure of timber firms as a basis for calculating the weighted average cost of capital (WACC) for the timber industry.

➢ Optimal capital structure for the timber industry.
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