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16151

Distr.
RESTRICTED

IO/R.24
29 January 1987

ENGLISH

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

FAO/ECA/UNIDO FOREST INDUSTRIES
ADVISORY GROUP FOR AFRICA (FIAG)

TF/RAF/82/001/11-01

TANZANIA

Technical Report: Timber for Construction *

Prepared for the Government of Tanzania
by the United Nations
Industrial Development Organization

Based on the work of
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PURPOSE

As a reply to FIAG's proposed cooperation with African institutions from the forestry sector (FIAG/85/23) the Faculty of Engineering from the University of Dar-es-Salaam expressed great interest in the proposition. A "Plantation Timber Study Team" was set up in the first months of 1986 composed of 3 members as a direct consequence to the FIAG enquiry "to collect and update data about plantation timber as well as to coordinate research findings". The main purpose of the mission was to establish personal contacts with the team and to discuss and eventually elaborate general guidelines for follow-up activities.

BACKGROUND

Originally exotic softwoods plantations were introduced into Tanzania in large scale in the 1950's and have been gradually expanded to some 85,000 ha at present. The plantation plan foresees a further expansion up to 114,000 ha by 1990. The most inportant species representing about 2/3 of all plantations is Pinus patula followed by Cupressus lusitanica. Other pines and eucalypts play a less significant role. The greatest continuous plantation comprises about 40,000 ha (Sao-hill). According to figures available at the University of Dar-es-Salaam, the annual allowable cut or total wood supply from thinning recoveries and clearfelling operations appears to be increasing, while only a small proportion (20%) of this potential is being utilized. To increase utilization of the already overmature stands, a pulp and paper mill is close to becoming operational.

The following table gives an indication of the unbalanced situation between Tanzania's plantations and its exploitable and actualy produced main forest products:

Roundwood Potential in Tanzania Government Softwood Plantations[1/]

YEAR	Demand (x 1000 m^3)			Surplus (x 1000 m^3)		
	Sawlog size	Chiplog size	Total	Sawlog size	Chiplog size	Total
1982	98	34	132	503	555	1058
1985*	206	245	451	395	344	739
1990	284	423	707	316	166	483

* Including demand of pulp and paper mill

TIMBER IN THE BUILDING SECTOR

Apart from utilizing the surplus of plantation timber for chipwood, fuelwood or for charcoal manufacturing, a significant market for the higher grade logs can be identified in the construction industry. Both, Pinus patula and Cupressus lusitanica grown in Tanzania are viable alternatives and/or complementary materials to cement and steel with the principle advantage of saving foreign exchange. Comparison between the two species reveals some slight differences in favour of C. lusitanica, which is denser, (410 kg/m^3 at 12% moisture contact against 400 kg/m^3 for Pinus patula) and stronger than P. patula (Modulus of rupture: 65 N/mm^2 for C. lusitanica against 56 N/mm^2 for P. patula). Both timbers are susceptible to insect attack, bluestain and fungal deterioration. Preventive treatment against bluestain is therefore necessary for more sophisticated enduses, (furniture manufacturing, interior decoration) while preservative treatment with pressure processes is compulsory if the timbers will be used in exposed sites or in ground contact.

Comparative studies of the strength of the two species with European conifers used for structural purposes revealed significant differences, i.e. the Tanzanian grown conifers only reached values at 65% of those

grown in Europe. This disadvantage is compensated by the far lower design load for local roof structures, which is only 40 to 50% of the corresponding load in a winter cold climate (snow load!), (3).

For local professional engineers and architects who design timber structures (hardwoods or softwoods) should not represent a major difficulty due to the ready availability of algorithms, tables and charts to design sections, joints, elements and structural systems. Equally accessible are basic strength parameters and values, as well as joint design data for Tanzanian timbers compiled by Campbell and Malde)(4). A technical committee within the Tanzania Bureau of Standards has started to elaborate a draft of "A Code of Practice for Structural Timber", based on the CIB-Code 1983 introducing limit state design. This initiative goes in parallel with an activity of the Faculty of Engineering which focuses on the compiling of material strength data and on experimental research with various fasteners and connectors.

Basing themselves on the availability of a variety of technologies and of a number of structural systems combined with skilled manpower resources the members of the Plantation Timber Study Team share the opinion that timber will therefore be considered more and more as a construction material.

COMMENTS AND RECOMMENDATIONS

Tanzania's present situation is very favourable for the promotion and marketing of timber especially for that originating from plantations. The country has both large resources and a high demand, which particularly in urban areas is far from being satisfied.

Timber is hence a very easy commodity to trade with , but unfortunately little is done as far as grading or general aspects of quality control are concerned. This is mainly due to the immediate need of the customers "virtually" to come to the sawmill and buy the wood fresh off the saw" leaving the seller neither time nor the necessity

to stock, season and/or grade his product. As long as these typical seller's market characteristics prevail in Tanzania, implementation of regulations such as the earlier mentioned "Code of Practice for Structural Timber" will face fundamental difficulties. The recently adopted policy to give more concessions to individuals for logging overmature stands certainly reduces further any possibilities of control or coordination.

From the above described characteristics of Tanzania's timber situation and as a direct result from the meetings with the Plantation Timber Study Team two main conclusions were drawn:

1. A concerted action or a permanent association should be initiated to coordinate plantation activities, logging and processing operations, and final distribution and marketing.

2. There is an immediate need to upgrade and to expand the processing capacity of Tanzania's forest products industry.

The Team will for a start put emphasis on the preparatory work for a concerted action. Depending on the support from the different sectors involved in forestry the interest group will then be in a position to establish guidelines for technical and financial assistance.

ANNEX I

TRAVEL ITINERARY

FIAC Mission: H. Günzerodt

Tuesday 21 October	- Flight LUSAKA - DAR-ES-SALAAM Meeting with the Plantation Timber Study Team
Wednesday 22 October	- Visit of the UNDP Office and meeting with the UNIDO SIDFA Visit of FAO, administrative matters Exchange of ideas with the Plantation Timber Study Team at the University of Dar-es-Salaam Visit of timber yard Tanzania Timber Marketing Co. Ltd. Discussion with the UNIDO SIDFA and Civil Engineers from University of Dar-es-Salaam
Thursday 23 October	- Visit of the Tanzania Forestry Research Institute and meeting with Director General CLoseup meeting with the Plantation Timber Study Team
Friday 24 October	- Flight DAR-ES-SALAAM - ADDIS

ANNEX II

PERSONS MET DURING THE MISSION

Dr. B.M. Mutagahywa,	Lecturer in Mechanical Engineering University of Dar-es-salaam
Mr. P.V. Mtenga,	Lecturer in Civil Engineering, University of Dar-es-Salaam
Professor Claussnitzer,	Head of Department, Mechanical Engineering, University of Dar-es-Salaam
Dr. A.L. Kyulule,	Dean, Civil Engineering, University of Dar-es-Salaam
Dr. Reinhard Sauer,	Lecturer in Civil Engineering, University of Dar-es-Salaam
Mr. T. Kikuchi,	UNIDO Senior Industrial Development Field Advisor, UNDP
Mr. T. Soe,	Civil Engineer, University of Dar-es-Salaam
Mr. W. Segu,	Head of Department, Civil Engineering, University of Dar-es-Salaam
Mr. G. Kitambi,	Acting Director General, Tanzania Forestry Research Institute, Kibaha
Mr. L. Nshubemuki,	Senior Forest Research Officer, Tanzania Forest Research Institute, Kibaha

ANNEX III

LIST OF REFERENCES

1. "Industrial Plantations in Tanzania and their species".
AHLBACK, A.J.;
Symposium on the use of local timber in buildings, 5 - 7 November, 1984, Arusha

2. "Timber from Tanzania"
Tanzania Timber Marketing Co. Ltd.
Dar-es-Salaam

3. "Structural timber design and use - scope and developments, relevance and prospects"
R. Sauer
Symposium on the use of local timber in buildings,
5 - 7 November 1984,
Arusha

4. "Timber for building in Tanzania"
P. Campbell and K. Malde
Ministry of Natural Resoruces and Tourism,
United Republic of Tanzania, 1971.