OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

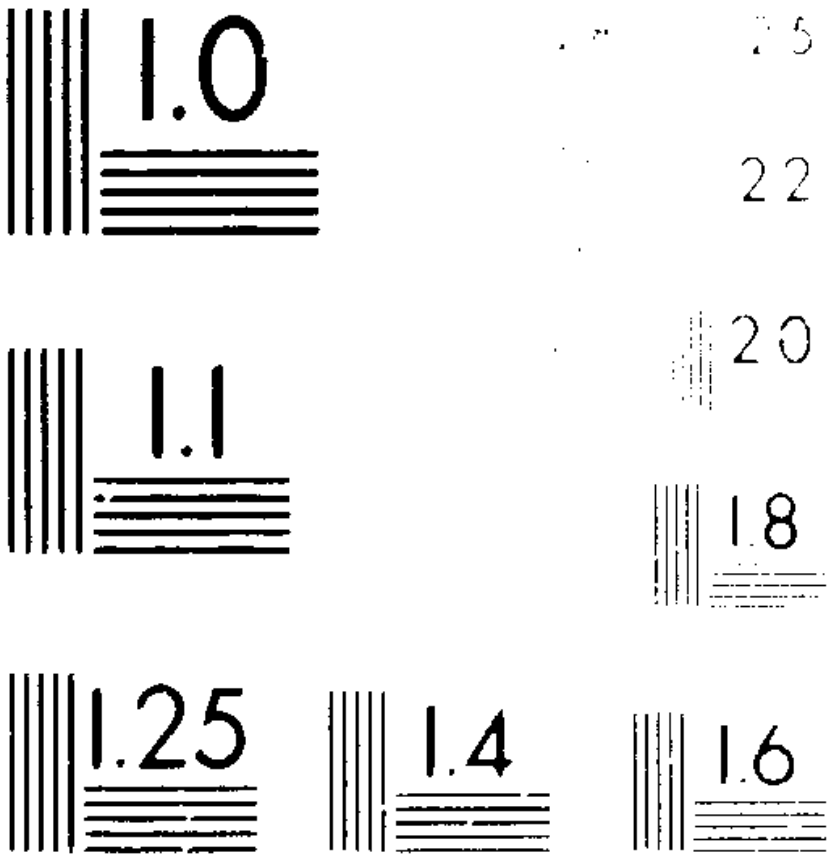
FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5

13491

FOLLOW-UP REPORT TO THE "FIRST CONSULTATION ON THE WOOD AND WOOD PRODUCTS INDUSTRY"

by

Amantino Ramos de Freitas*
UNIDO Consultant

February 1984

* Head, Wood Division, IPT S/A, São Paulo, Brazil

F O R E W O R D

This paper was prepared as a follow-up activity to the "First Consultation on the Wood and Wood Products Industry", held in Helsinki, Finland, from the 19th to the 23rd September 1983, under the joint sponsorship of UNIDO/FAO.

The ideas and points of view presented here reflected a personal interpretation of the information contained in the ample documentation distributed at the Consultation, and at its preparatory meetings. They are also based on the discussions and deliberations of the Consultation itself, in particular, those referring to Working Group I, "Development of Primary and Secondary Wood Processing Industries", chaired by the author.

TABLE OF CONTENTS

LIST OF FIGURES

I. INTRODUCTION

1. This report attempts to reach three objectives:

   a) to present a global, but concise, view of the main issues discussed at the Consultation;

   b) to suggest possible actions to implement recommendations agreed upon, in particular with regard to the co-operation between specialized research and development institutions;

   c) to identify a number of subject areas to be included in future consultations.

2. After reviewing the documents prepared by the secretariat, and also related documents from other sources, it became apparent that the basic methodology used in strategic planning could provide a safe track to the attainement of the objectives mentioned above. This methodology has been successfully used for the preparation of two recent documents related to the forest sector in Brazil (17, 22)*.

3. However, it should be made clear that although the essence of the technique being used is the same, the present report does not, by any means, intend to be taken as any form of strategic planning paper for the wood and wood industry sector. The generation of such a document would take intensive preparation over a period of time and would require the concerted efforts of many experts in the field.

4. Basically, the steps are the following:

   A) Definition of the problem:

      - What is the present situation of the wood and wood products industry?

      - What is the expected future situation?

* numbers in parenthesis refer to the references cited.

B) Diagnostic

- What are the external conditions (environmental) that affect the development of the sector? How can they be interpreted as opportunities and threats?
- What are the internal factors that influence the sector? How can they be classified into strenghts and weaknesses?

C) Formulation of guidelines

- What are the lines of action suggested by comparing the opportunities with the strengths, and, in the same fashion, the threats with the weaknesses?
- Conversely, does the comparison between opportunities and threats, and also strengths with weaknesses, suggest any line of action?

D) Selection of priority guidelines and recommendations towards their implementation

- What is to be done?
- How should it be done?
- When?
- By whom?

5. It is recognized that the conclusions and recommendations presented in the reports of the regional preparatory meetings and in the final report of the Consultation (V. Appendix) are basically the net result of the exercise of strategic planning described above. However, it is hoped that this exercise will contribute to further crystallization of the main issues and a clear selection of some priority lines of action.

II. DEFINITION OF THE PROBLEM: PRESENT AND EXPECTED FUTURE SITUATION OF THE WOOD AND WOOD PRODUCTS INDUSTRY

6. The analysis of the present and future situation of the wood and wood products industry is presented here according to each one of the seven subject areas that were discussed at the regional preparatory meetings. The conclusions and recommendations of the meetings, plus those of the Consultation, are also grouped together by subject area and presented in the Appendix.

1) RAW MATERIAL

Present Situation

7. In 1980, developing countries held 1,035 million ha (52,4%) of the world's exploitable forests, while developed countries held 940 million ha (47.6%);

8. In 1980, developing countries held 161,000 million m^3 (62.7%) of the total standing volume of the world's forests, while developed countries held 96,000 million m^3 (37.3%);

9. Due to regional imbalances, some developing countries already face, and will increasingly face in the future, acute shortages of wood both for industrial use and fuel;

10. Most of the forest-rich developing countries are only using a small fraction of the volume of wood available in their forests. Lack of land-use planning, multiplicity of species in tropical native forests, absence of information on the volumes and on the technological properties of the commercially less accepted species (CLAS), and lack of knowledge of tropical sylviculture are the limiting factors to a more rational exploitation of forest resources;

11. Utilization of residues ("lost crops") is marginal due to lack of infrastructure, technology, and marketing;

12. The area of tropical forests is being reduced at an annual rate of 11.3 million hectares (~ 1%), mainly due to clearing for agricultural land. A 1978 report from the World Bank (29) states that, unless some fundamental changes occur, the forest area of developing countries could disappear within 60 years;

13. Total area of planted forests in developing countries reached 13 million hectares in 1980, of which about 47% are in Latin America, 39% in Asia and 14% in Africa. Annual plantation rates for the period 1981-85 are estimated to be 535.000 ha for tropical America, 438.000 for tropical Asia and 126.000 ha for tropical Africa. Although small in relative terms, planted forests are the major source of industrial wood in some developing countries, especially for the production of pulp and paper, and hardboard (24).

Expected Future Situation

14. It is expected that in the year 2000, the total consumption of roundwood will grow from the 1975 level of 2800 million m^3, of which 47.4% was industrial wood and 52.6% fuel wood, to 3900 million m^3, with 53.4% of industrial wood and 46.6% of fuel wood;

15. From their 1975 share of 27.2% of the world's roundwood production, developed market economy countries will climb to 29.8% in the year 2000; central planned economy countries will change very little, from 26.2 to 26.3%, and developing market economy countries will show a decrease, from 46.6% to 43.9%;

16. The reduction of the relative participation in the production of roundwood will take place mainly in the African countries, from 12.4% to 9.9%, and to a smaller degree in the Eastern European Countries and USSR, from 16.7% to 16.2%, and Asian countries, from 34.7% to

32.9%. North America's share will grow from 16.2% to 17.2%, and South America's from 11.0% to 13.4%;

17. In the year 2000, the developed market economy countries will have to import about 130 million m^3 of industrial roundwood and processed wood, a sharp increase from the 1975 figure of 75 million m^3. Main importers are expected to be Japan, 118 million m^3, and Western Europe, 75 million m^3;

18. Main suppliers will be the developing market economy countries, from 41 million m^3 in 1975 to 80 million in 2000, and also the USSR and the Eastern European countries, from 34 to 50 million m^3;

19. Additional supplies of tropical hardwood in the near future are expected to come from areas without strong restrictions on log exports, such as: Sarawak, Burma, Papua New Guinea, and Equatorial Guinea. In the long term, logs will come from areas not yet exploited, such as those in West Irian, Papua New Guinea, Amazon Region, and Central Africa (26).

2) PRIMARY AND SECONDARY PROCESSING

Present Situation

20. In the period of 1978-80, developing countries accounted for approximately 25% of the total production, which reached 850 million m^3, of saw logs and veneer logs;

21. In 1981, developing countries were responsible for about 30% of all primary wood products, estimated at about 880 million m^3 roundwood equivalent;

22. In the period of 1978-80, developing countries were responsible for about 60% of all exports of saw logs and veneer logs, estimated to be around 75 million m^3;

23. Some developing countries that have been traditional suppliers of saw logs and veneer logs, such as Indonesia, Malaysia and the Philippines, have recently adopted measures to restrict the export of unprocessed wood (26);

24. Most developing countries would benefit from increased local processing of their wood, but lack the required capital, technology, and skilled labor;

25. Local markets to absorb by-products and lower grades of the processed wood going to the export market are often too small to justify integrated operations.

Future Situation

26. By the year 2000, in developing countries, the consumption of sawnwood is expected to grow by 95% and that of wood based panels by 200%. As a consequence, the total amount of industrial wood used for domestic consumption in developing countries will increase from the present level of 150 million m^3 to 285 million m^3. Growth of consumption in developed countries will be at a slower pace;

27. As developing countries increase local processing of their wood in order to satisfy the demands of their domestic markets, and also create jobs and earn foreign exchange, importing countries will face reduced availability of raw materials;

28. However, in order to significantly increase the volume of production and the degree of processing, developing countries will need investment capital, adequate technology, and skilled labor;

29. Integrated wood-processing centers will allow for a more rational utilization of the forest resources. They will be able to make use of a wide range of species and types of logs, while keeping

waste and residues to a minimum.

3) TRADE, TRANSPORT, AND MARKETING PROBLEMS

Present Situation

30. Developing countries face increasing protectionism against their wood products in the form of tariff and non-tariff barriers, as the degree of the processing increases;

31. Developing countries do not have access to adequate marketing channels, and lack proper standards and technical information to promote their wood products;

32. Due to a lack of infrastructure, such as adequate roads and port facilities, and due to the exorbitant freight rates charged by conference lines, transportation costs are very high for wood products originating from developing countries.

Future Situation

33. Restriction of the export of unprocessed wood wy traditional suppliers will raise the price of logs from tropical regions and increase the trade of sawnwood, veneers, and plywood (26);

34. On the other hand, due to special reasons, some countries that have not exported logs to any significant extent, such as Brazil, may enter the market. In this case, justification for abolishing the country's ban on log exports that had been in effect since 1969 was the need to put to use the large volumes of wood, mostly commercially less accepted species (CLAS), that had to be removed from the flood basins of a number of hydrelectric projects in the Amazon region;

35. Large importers of unprocessed tropical wood, such as Japan,

Taiwan, and South Korea, will have to find creative solutions in order to secure adequate supplies of raw material for their industry. Joint ventures, with provision of capital, technology, trained personnel, and marketing channels to local enterprises may prove to be a successful route;

36. Finally, the question of freight rates, proctectionism, distribution channels, and other matters relating to the trade, transportation, and marketing of wood products will gain a new forum of discussion with the establishment of the "International Tropical Timber Agreement - ITTA", under the auspices of the UNCTAD integrated Programme for Commodities.

4) FINANCE

Present Situation

37. Most of the developing countries are either unaware of or do not have access to adequate financing for their wood industries with regard to:

- investment studies
- forest rehabilitation, afforestation, and reforestation
- infrastructure development
- industrial modernization and expansion
- training, research and development
- reserve stocks

Future Situation

38. It is hoped that governments and international financing institutions will recognize the social, environmental, and economic benefits that a strong wood and wood products industry can bring to

every developing country with significant forest resources;

39. Some countries have already adopted incentive programs for afforestation and reforestation that have resulted in appreciable expansion of the area covered by planted forests;

40. The World Bank (IBRD) has recently re-assessed its position with respect to the financing of forestry-related projects, giving high priority to projects such as environmental forestry, rural development, and institution-building projects, besides regular industrial forest projects (29);

41. The Inter-American Development Bank (IDB) has also recently emphasized the role that international lending institutions could play by providing seed money for forestry-related projects in developing countries (24); special consideration should be given to the long pay-back periods that these projects require, and also to the many indirect benefits they can bring to these countries.

5) TECHNOLOGY, RESEARCH AND DEVELOPMENT

Present Situation

42. Although the technology may be available for the correct processing of tropical woods, most developing countries are using obsolete methods and equipment, with consequent losses in quality, yields, and productivity;

43. Research and development institutions do not have adequate channels to disseminate the information they generate to the industry of the developing countries. They do not have good means of exchanging information among themselves either;

44. Developing countries do not have adequate standards for their

wood products; very often this fact becomes a non-tariff barrier against their export to developed countries;

45. Considerable effort is needed in developing countries for generating more technical information on the processing and utilization of commercially less accepted species (CLAS).

Future Situation

46. In developed countries, technology has helped production by making a broader use of the resource base, as raw material quality gradually declined. For example, preserving non-durable species relieved the pressure on highly durable woods; glu-lam, made up of small diameter material, replaced large sized timbers: particleboard and fiberboard are replacing plywood and lumber;

47. In developing countries it is expected that technology will bring:

- increased utilization of CLAS
- increased utilization of residues
- increased productivity in mechanical processing through the use of adequate equipment and techniques
- increased productivity of planted forests, through the use of appropriate species, provenances, tree breeding techniques, and forest management;

48. With respect to research and development, institutions of developing countries are expected to harmonize their efforts on a regional basis, in order to effectively solve specific industry problems;

49. National, regional and international standards organizations are expected to work together in order to supply the industry with adequate

standards for the domestic and export market, taking into account the available raw material, processing facilities, and level of technology.

6) INDUSTRIAL INFRASTRUCTURE

Present Situation

50. In most developing countries there is an urgent need to train manpower at all levels: production, technical, managerial, and marketing;

51. Developing countries, by and large, do not have professional and industrial associations that could provide the strong support needed to the development of the wood and wood products industry;

52. There is also a need to be filled by industrial extension services with regard to technical assistance, design and engineering;

53. In some developing countries the wood products industry suffers from the lack of local suppliers of spare parts, ancillary equipment and materials, such as metal fittings, adhesives, finishes, etc.

Future Situation

54. As economic development takes place, it is expected that the industrial infrastructure of developing countries will improve. However, in many areas, the degree of such an improvement will strongly depend upon official policies regarding education, vocational and professional training, and industrial, scientific, and technological development;

55. Industrial infrastructure in developing countries will also be affected by available financing from international sources towards general development projects, such as road construction, power generation, rural development, etc.

7) REDEPLOYMENT OF INDUSTRY, INTERNATIONAL AND REGIONAL CO-OPERATION

Present Situation

56. Countries that import logs or semi-processed wood sometimes do not feel confident enough in making long-maturation investments in developing countries. They tend to maximize their profits and are mostly interested in securing raw material for their home operations;

57. On the other hand, some developing countries have entered long-term arrangements with the developed countries that import their products, in order to regulate supplies of raw-material, and solve problems regarding transportation, technology and marketing;

58. There is a need for international and regional co-operation in harmonizing and supporting the efforts of developing countries in research and development, industrial extension services, training, and monitoring of markets.

Future Situation

59. Resource-poor, but industry-rich, countries will increasingly engage in joint ventures with recource rich, but industry-poor countries, in order to maintain their markets of wood products. International organizations will have an important role to play in this type of co-operation, by supplying the interested parties with contractual check lists, model agreements, etc.;

60. As the raw material quality diminishes, and as labor costs and

environmental problems become more critical in some developed countries, there will be a trend to dislocate some types of forest industries into developing countries with ample forests, abundant manpower, and less strict environmental regulations. Marketing channels, however, will probably remain within the sphere of influence of the developed countries;

61. Regional and international co-operation will probably be easier implemented in technical areas, such as exchange of data, training, and standardization, rather than in the areas related to the production and trading of wood products;

62. As in any other field, any form of international co-operation that does not involve commercial interests will have to be carried out with the support and assistance from willing governments and multilateral organizations. These organizations may prove to be the essential catalysts for the materialization of co-operation programs between developed and developing countries, as well as among developing countries themselves.

III. DIAGNOSTIC: THE EXTERNAL AND THE INTERNAL ENVIRONMENT OF THE WOOD AND WOOD PRODUCTS INDUSTRY

63. The external conditions that affect the development of the wood and wood products industry in developing countries may be divided in two categories:

- those that tend to stimulate this development, hereby referred to as opportunities;
- those that are likely to hamper development, hereby referred to as threats.

64. In the same fashion as above, the internal factors that influence the wood and wood products industry may be considered as:

- strengths, which favor development, and,
- weaknesses, which inhibit development.

1) MAIN OPPORTUNITIES

65. There is a market trend for increased consumption of tropical woods by developed countries;

66. Due to the restrictions recently imposed on exports of unprocessed wood by a number of traditional suppliers of saw logs and veneer logs, there is a favorable climate for joint ventures between developed countries that import significant volumes of wood and the corresponding developing countries that supply them;

67. International financing organizations are re-assessing their position towards the concession of loans to developing countries for the establishment of fores-related projects, taking into account the

social and environmental benefits that they promote;

68. Modern forest management techniques and careful selection of species and provenances have brought a dramatic increase in the productivity of planted forests in tropical countries;

69. Multilateral organizations are making efforts to help forest--rich developing countries make the best use of their forest resources, by providing them with assistance in all phases of the productive process as well as in marketing.

2) MAIN STRENGTHS

70. A great number of developing countries present highly favorable conditions to the establishment of the wood and wood products industry, such as: availability of adequate land, suitable climate, low labor costs, and abundant raw material, either from native or planted forests. As a rule, productivity of planted forests in tropical countries is significantly higher than those of temperate climates (24);

71. Wood industries usually demand low investments and are basically labor-intensive; they also can be energy self-sufficient if residues are properly used as fuel;

72. Being labor-intensive and resource-based, the wood and wood products industry can promote rural development, thus contributing to retaining agricultural laborers away from crowded urban centers;

73. The wood and wood products industry can provide a large proportion of the building materials that are needed to meet the acute housing shortage faced by most developing countries;

74. Finally, research and development institutions from developed and developing countries, with varying degrees of technical capabilities, are available to carry out studies in order to solve technical problems of the wood and wood products industry. Moreover, they hold considerable amount of information on properties of tropical species and on the primary and secondary processing of wood.

3) MAIN THREATS

75. Developed countries, in order to protect their local industry, tend to impose tariff and non-tariff barriers against manufactured products from developing countries;

76. High freight rates charged by conference lines affect the competitiveness of wood products from developing countries;

77. Developing countries have little or no access to marketing channels for their wood products;

78. Advanced technology and equipment from developed countries are not always available and/or adequate to the conditions of developing countries;

79. Native forests in developing countries are being degraded or destroyed at rates that are much faster than their re-habilitation or the establishment of new forests. Most countries lack a clear definition of land-use policies that would prevent "predatory" harvesting, shift cultivation, slash and burn technique, and other ill practices that contribute to the dissapation of their forest resources. Scarcity of supplies of tropical woods in the international market may stimulate competition from temperate-climate species and from other materials such as aluminum and plastics.

4) MAIN WEAKNESSES

80. Most developing countries lack properly trained personnel, at all levels, that are needed to promote a firm development of their wood and wood products industry;

81. Most developing countries lack the required financial resources for establishing adequate infrastructure, sources of raw material, industrial installations, and also for the build-up of reserve stocks;

82. Most developing countries do not have the technology to correctly cut, transport, and process their wood. Although suitable technical information may exist in some research and development institutions, it is not being made adequately available to those that need it;

83. Most native forests of developing countries present a great number of species per unit area of forest, and only a few of them are being processed and brought to market. The remainder consists of commercially less accepted species (CLAS), whose standing volumes and technological properties need to be evaluated before any substantial effort can be made to promote their effective marketing;

84. Finally, developing countries, by and large, lack basic infrastructure such as roads, ports, water and power supply, which hinders the development of the wood industry and cause production costs to escalate.

IV. FORMULATION OF GUIDELINES

85. The procedure already described in the Introduction Chapter for the formulation of guidelines, through various comparisons between opportunities with strengths, threats with weaknesses, and other combinations, may be best carried out with the help of a diagram as depicted in Fig. 1;

86. Basically, in this diagram each influencing factor of the environment, internal or external, is represented by a line that crosses all the others;

87. Such crossing may or may not suggest a line of action. When a definite line of action is inferred, the crossing can be interpreted as being fertile; otherwise, it is considered sterile;

88. The lines of action thus generated can be combined into guidelines that involve recommendations about various influencing factors;

89. Priority guidelines may then be chosen by taking into account the balance between the efforts they require to be implemented and the benefits they are expected to bring;

90. The task of identifying lines of action by inspecting the crossings in Fig. 1 implies a subjective judgement to some degree; thus, some lines of action may be more apparent to one person than to another. For this reason, the availability of a group of experts to evaluate those that are really important is a key element in the process;

91. However, as it was mentioned earlier, the exercise presented here is based on the opinion of the author and has the sole objective of bringing out a clear selection of guidelines, by analysing a large number of simpler lines of action;

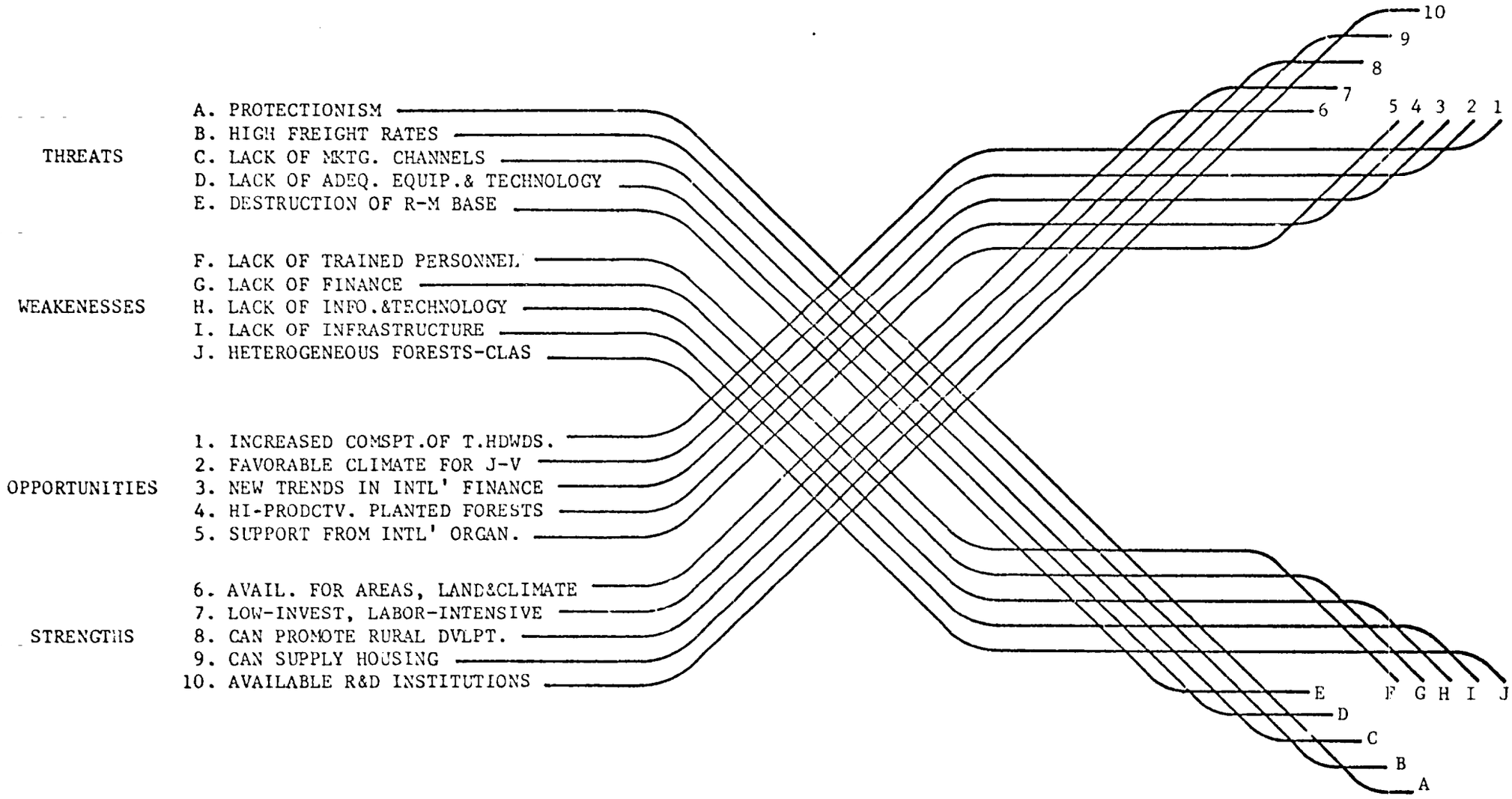


FIGURE 1. Diagram for generating lines of action by comparing external and internal factors that influence the development of the wood and wood products industry in developing countries

92. The analysis of the crossings presented in Fig. 1 can be carried out in any particular order, i.e., any line can be selected with the objective of examining its interaction with each one of the rest of lines. However, it seems more convenient to start with those factors that seem to be stronger and that show greater probability of fertile crossings;

93. For example, as shown in Fig. 2, Opportunity n. 2, "Favorable climate for joint ventures", may yield fertile crossings at:

(2,J), (2,I), (2,H), (2,G), (2,F), (2,F), (2,E), (2,C), (2,B), (2,A)

(2,6), (2,7), (2,8), (2,9), (2,10)

(2,5), (2,4), (2,3), (2,1)

94. A guideline based on the lines of action suggested by these crossings could read:

"International organizations should assist forest-rich developing countries in entering joint venture agreements with developed countries with the objective of developing their wood and wood products industry: (2,1), (2,5), (2,6). These agreements should consider the following aspects:

a) preservation of the raw material base through the adoption of sound forest management practices that ensure sustained yield exploitation, and emphasis on the utilization of commercially less accepted species (CLAS). (2,E), (2,J). If sustained yield cannot be economically attained, guarantee of supply should be based on high-productivity homogeneous forests. (2,4);

b) improvement of existing infrastructure and, if needed, construction of roads and port facilities, possibly with finance obtained from international lending institutions. (2,I), (2,G), (2,3);

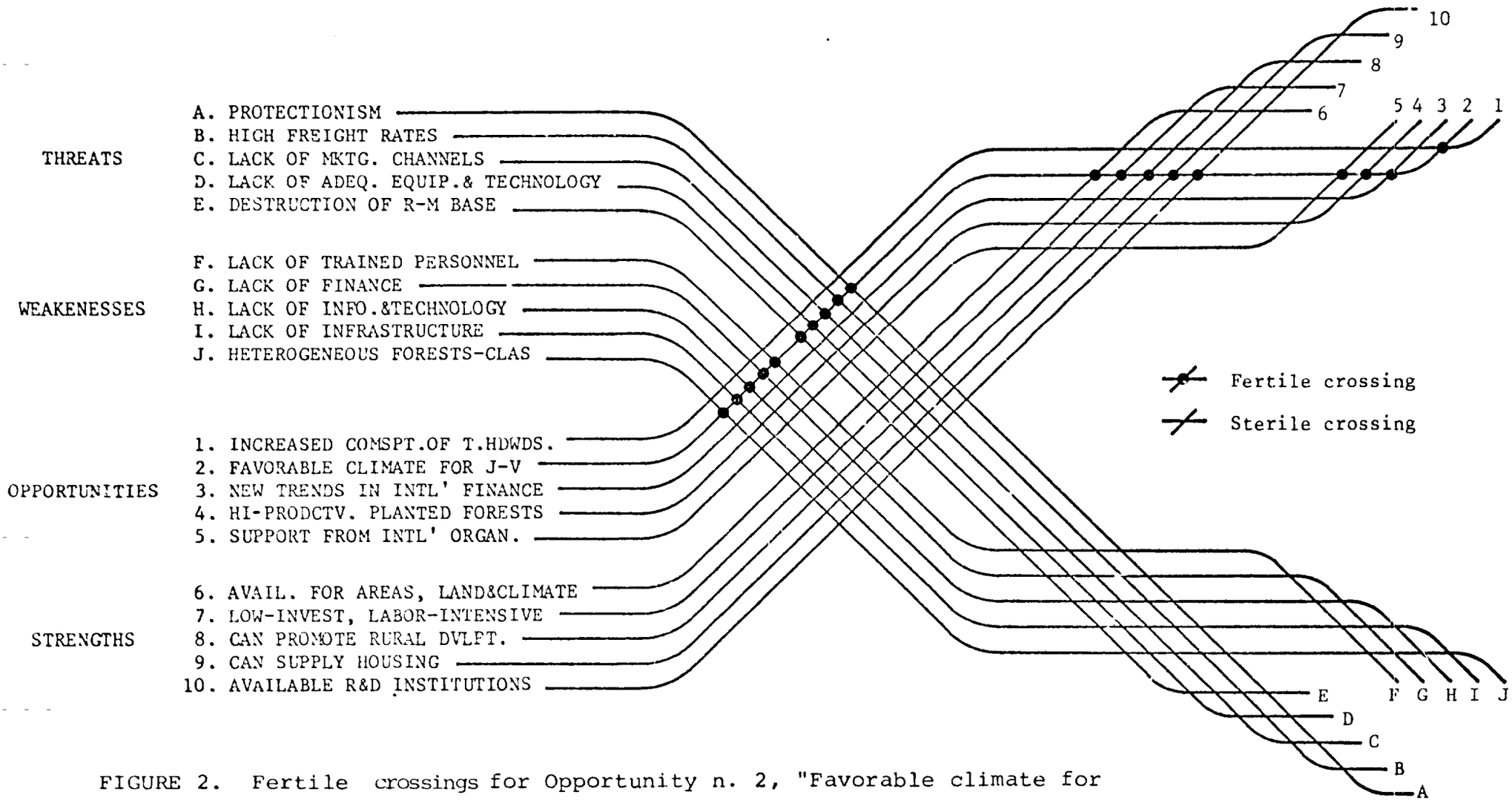


FIGURE 2. Fertile crossings for Opportunity n. 2, "Favorable climate for joint ventures"

c) provision of technology, equipment, and training, with emphasis on the absorption of local manpower, and on the development of the communities involved. (2,D), (2,F), (2,7), (2,8);

d) provision for sharing the marketing channels and for negociating the elimination of tariff and non-tariff barriers with importing countries. (2,A), (2,5);

e) study of inovative types of transportation, such as containers, charter vessels and custom-designed ships, in order to lower costs and expedite deliveries. (2,B);

f) transference of know-how for the construction of wooden houses, initially to provide shelter to the industry's workers, and later on to the people of near-by communities. The houses built for the workers would serve as demonstration projects. (2,H), (2,9);

g) finally, the industrial enterprise to be established in the developing country should seek to make intensive use of the technological services provided by the local research and development institutions. Whenever a lack of capability becomes apparent, efforts shall be made to link the local research institute with a correspondent institute in the developed country. (2,H), (2,10)".

95. Another example, shown in Fig. 3, is represented by the crossings related to Opportunity n. 5, "Support from international organizations", as follows:

(5,J), (5,I), (5,H), (5,G), (5,F), (5,e), (5,D), (5,C), (5,B), (5,A)

(5,6), (5,7), (5,8), (5,9), (5,10)

(5,4), (5,3), (5,2)

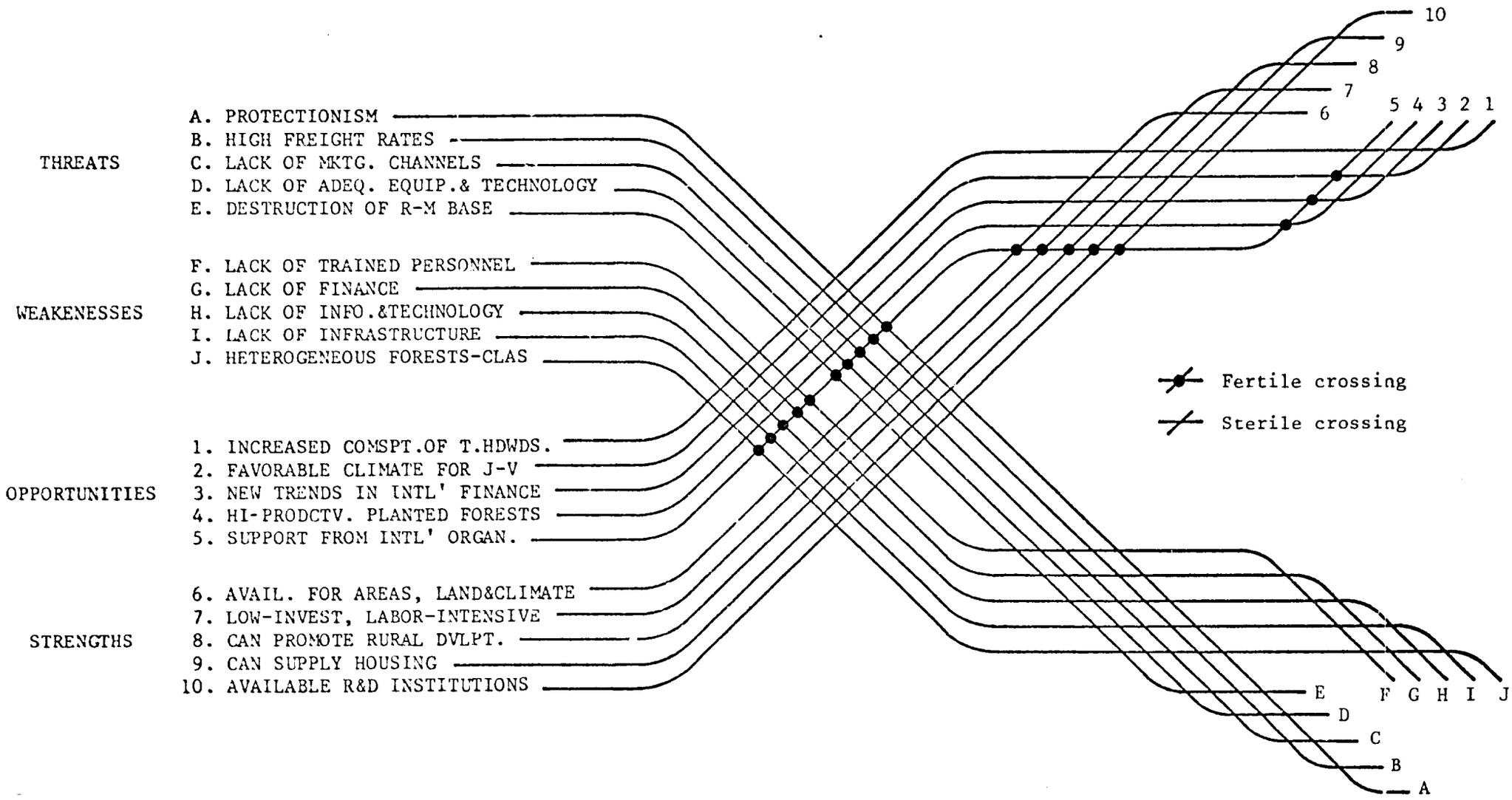


FIGURE 3. Fertile crossings for Opportunity n. 5, "Support from International Organizations"

96. A guideline based on the lines of action suggested by the crossings above could be stated as:

"International organizations should assist the governments of developing countries in identifying adequate sources of financing for forestry-related projects. (5,3), (5,G). They should also provide support to the conduction of basic studies to be submitted to the financial institutions previously identified, in order to obtain funds for:

a) infrastructure development. (5,I);

b) development of global and regional information base on properties and utilization of species occuring in developing countries. (5,J), (5,H);

c) training of personnel at all leves. (5,F);

d) development equipment to process tropical woods. (5,D);

e) establishment of sustained-yield forest projects in tropical areas. (5,E);

f) establishment of high-productivity homogeneous forests in order to increase the supply of industrial and fuel wood. (5,4), (5,6);

g) establishment of wood processing plants suitable to the conditions of developing countries, with emphasis on employment, house construction, and rural development. (5,7), (5,8), (5,9);

h) strengthening local research and development institutions, with emphasis on the study of commercially less accepted species and on the solution of the problems of local industry. (5,10), (5,J), (5,H)."

97. Another guideline suggested by the crossings generated by Opportunity n. 5, "Support from international organizations", could be:

"International organizations should conduct specific studies in the areas listed below in order to improve the current situation of the wood and wood products industry in developing countries:

a) tariff and non-tariff barriers. (5,A);

b) transportation costs of wood and wood products, both for inland and ocean routes. (5,B);

c) market structure and marketing channels in developed countries for wood and wood products. (5,c)."

98. The recommendation listed under item 13.(b), page 6, of the final report of the Consultation, can be taken as the guideline for possible co-operation between especialized research and development institutions. This guideline may also be obtained from the analysis of the crossings related to strength n. 10, "Availability of research and development institutions", which, as shown in Fig. 4, are the following:

(10,J), (10,H), (10,G), (10,F), (10,E), (10D)

(10,5), (10,4), (10,3), (10,2), (10,1)

(10,7), (10,8), and (10,9);

The above mentioned recommendation is the following:

"UNIDO should identify, in collaboration with other international bodies, the existing facilities and availability of specialized research and development institutions in both developing and developed countries and identify areas of existing and potential co-operation between them, for example, through twinning arrangements, to ensure

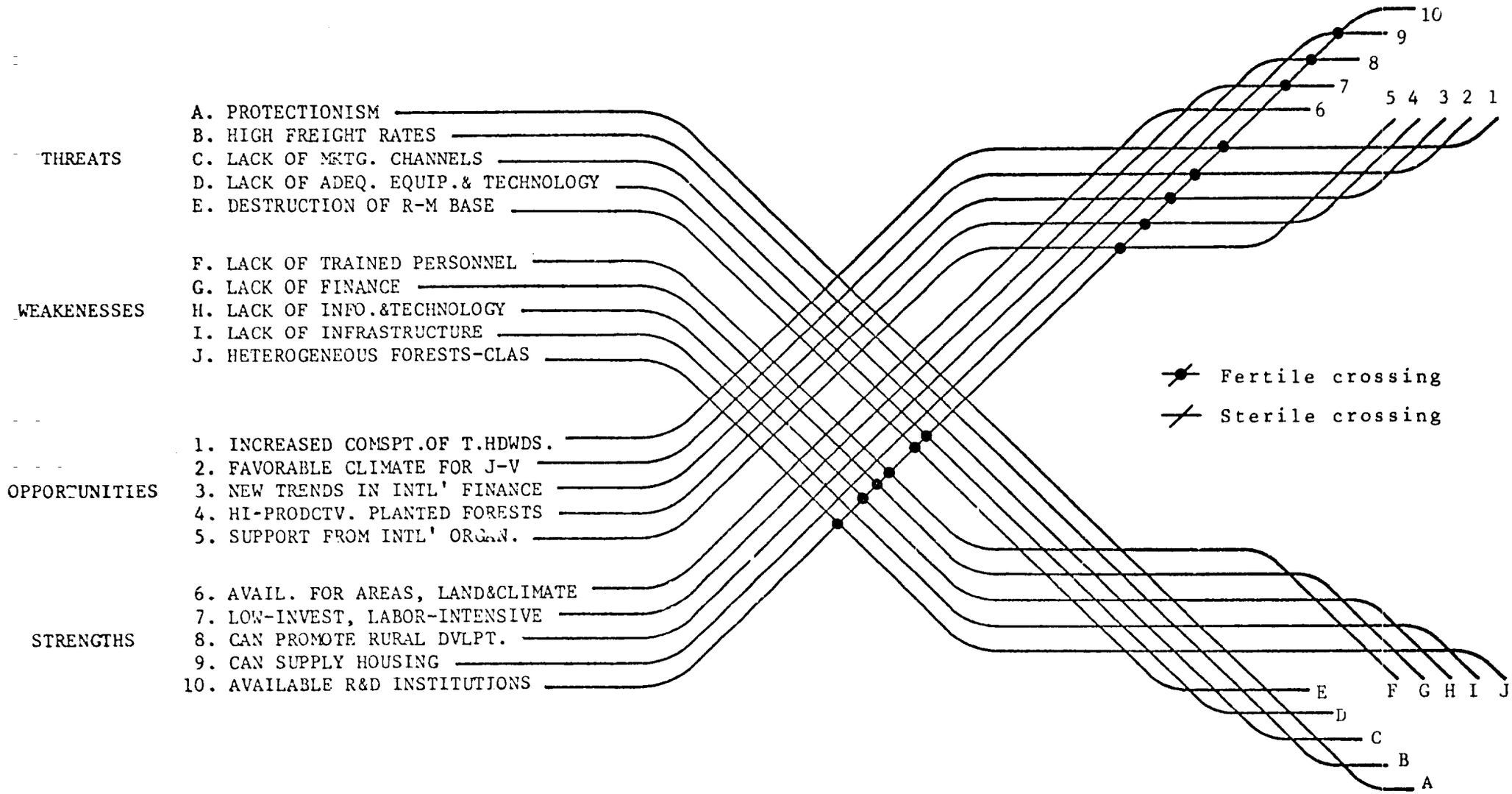


FIGURE 4. Fertile crossings for Opportunity n. 10, "Available research and development institutions"

a full utilization of natural resources in developing countries". (10,5), (10,E).

Special emphasis should be placed on:

a) obtaining financial support from multilateral organizations, from developed countries (bi-lateral aid), and from the governments of interested developing countries themselves (TCDC)*, in order to make possible these co-operative programs. (10,2), (10,3);

b) establishing global and regional data banks on technological properties and utilization of tropical species, including commercially less accepted species (CLAS), in order to better promote their utilization. (10,H), (10,J), (10,1);

c) formulating industrial extension programs in order to disseminate available technical information to the industrial users, with the objective of increasing yield and productivity. (10,H), (10,E);

d) training of personnel, especially through the exchange of managers and specialists, technical visits, seminars, and short courses, etc. (10,F);

e) promoting the use of wood in construction in general, and in housing in particular. (10,9);

f) selecting and adaptating equipment from developed countries in order to make them suitable to the conditions prevailing in developing countries. (10,D);

g) utilizing raw material produced by high-productivity homogeneous forests. (10,4);

h) establishing small wood processing plants adequate to the

* Technical Co-operation between Developing Countries

conditions of developing countries, in order to promote employment and rural development. (10,7), (10,8).

99. The three examples given above for the generation of guidelines could be repeated for the remaining seven factors. It is obvious that, as the exercise continues, the number of new fertile crossings diminishes due to duplication with previous combinations.

100. The assignment of priorities to the guidelines formulated through this process should be done by a team of experts. In order to meet the objectives of this paper, as described in the Introduction Chapter, only the guideline referring to the co-operation between research and development institutions will be analysed for possible recommedations toward implementation.

V. RECOMMENDATIONS TOWARD THE IMPLEMENTATION OF THE GUIDELINE REGARDING CO-OPERATION BETWEEN ESPECIALIZED RESEARCH AND DEVELOPMENT INSTITUTIONS

101. Main Guideline

UNIDO should identify, in collaboration with other international bodies, the existing facilities and availability of specialized research and development institutions in both developing and developed countries and identify areas of existing and potential co-operation between them, for example, through twinning arrangements, to ensure a full utilization of natural resources in developing countries.

102. What is to be done?

An inventory of all significant research and development institutions that deal with wood and wood products should be carried out.

103. How is it to be done?

a) *By means of a questionnaire sent to all institutions, specifying details such as size and type of facilities available, quantity and quality of the staff, main areas of interest, availability to receive outside trainees and plans for strengthning or establishing new technical capabilities;*

b) *Samples of similar questionaires already sent ou for other areas by UNIDO or by other organizations like, FAO, UNESCO, WAITRO, IUFRO, ITTO, could serve as the basis for such a document;*

c) *In order to allow for computer treatment of the data, attention should be paid to the format and structure of the questionaire;*

d) *The final result of this survey should be made available in the form of a booklet to be distributed amon all participants.*

104. When is it to be done?

As soon as UNIDO fits it into its operational schedules.

105. By whom?

By UNIDO in co-operation with other international organizations such as FAO, UNESCO, RITLA, WAITRO, IUFRO, IRG, etc.

106. Subguideline 1

Obtaining financial support from multilateral organizations, from developed countries (bi-lateral aid), and from the governments of interested developing countries themselves (TCDC), in order to make possible these co-operative programs.

107. What is to be done?

Identify sources and obtain financial support for making international co-operation between research and development institutions possible.

108. How?

By the contacting the probable sources such as:

a) *multilateral organizations like UNCSTD, OAS, IBRD, IDB, ADB, BADEA, ECA, ECLA, etc.*

b) international development agencies from developed countries such as: USAID, CIDA, IDRC, SIDA, GTZ, JICA;

c) agencies from developing countries that are in charge of technological development and represent the local instrument to implement technological co-operation between developing countries (TCDC) such as: CNPq (Brazil), CONACYT (Mexico), CONICIT (Venezuela) and CONICET (Argentina).

109. When?

As soon as UNIDO is able to do it.

110. By whom?

By UNIDO in co-operation with other international organizations. In the year 1983, for example, WAITRO was able to secure about US$ 60,000 to promote twinning arrangements between its member institutions.

111. Subguideline 2

Establishing global and regional data banks on technological properties and utilization of tropical species, including commercially less accepted species (CLAS), in order to better promote their utilization.

112. What is to be done?

Gathering and consolidation of available information on tropical species so that it can be processed and made available to all interested parties.

113. How should it be done?

By asking the research and development institutions and carefully

processing the information they supply. An effort should be made with respect to the suitability of involving existing commercial information systems.

114. When?

As soon as UNIDO is able to do it.

115. By whom?

By UNIDO, in cooperation with FAO, IUFRO, WAITRO and other relevant international organization in the field, making use as much as possible of existing infrastructure.

116. Subguideline 3

Formulating industrial extension programs in order to disseminate available technical information to the industrial users, with the objective of increasing yield and productivity.

117. What is to be done?

Disseminate and put to work the technical information generated at the research and development institutions.

118. How should it be done?

Prepare informative material and organize short courses, seminars, lectures, etc., in order to disseminate good, simple practices that can improve efficiency and productivity in all phases of the production cycle.

119. When?

As soon as UNIDO is able to.

120. By whom?

By UNIDO, after receiving adequate inputs from research and development institutions, and by the institutions themselves.

121. Subguideline 4

Training of personnel, especially through the exchange of specialists and managers, technical visits, seminars, short courses, etc.

122. What is to be done?

Develop the human resources of the research and development institutions.

123. How should it be done?

After the inventory referred to in Item 102 is completed, it will be possible to match the needs of some research and development institutions with the technical capabilities of others. Hopefully, financial support can also be secured as discussed in subguideline n. 1, so that this type of activity can be implemented.

124. When?

After identification of needs and capabilities and guaranteeing the required financial resources.

125. By whom?

By UNIDO in co-operation with WAITRO, IUFRO, or other international organizations, and participating research and development institutions.

126. The other four remaining subguidelines relate more to the role

of the research and development institution in its local environment, rather than to its interaction with similar organizations from other countries. For this reason their implementation will not be discussed here.

127. List of the institutions and organizations mentioned in this chapter:

- ADB - African Development Bank
  Abidjan
- BADEA - Bank Arabe pour le developpement economique d'Afrique
- CIDA - Canadian International Development Agency
  Ottawa
- CNPq - Conselho National de Desenvolvimento Científico e Tecnológico
  Brazil
- CONACYT - Consejo Nacional de Ciencia y Tecnologia
  Mexico
- CONICET - Consejo Nacional de Investigaciones Cientificas y Tecnicas
  Argentina
- CONICIT - Consejo Nacional de Investigaciones Cientificas y Tecnologicas
  Venezuela
- DSE - Deutsche Stiftung für Internationale
  Entwicklung, Berlin
- ECA - Economic Commission for Africa
  Addis Ababa
- ECLA - Economic Commission for Latin America
  Santiago
- GTZ - Gesellschaft für Teschnische Zusammenarbeit
  Germany
- IBRD - International Bank for Reconstruction and Development
  (World Bank)
  Washington
- IDB - Inter-American Development Bank
  Washington

- IDRC - International Development Research Centre
  Ottawa

- ILO - International Labor Organization
  Geneve

- IRG - International Research Group on Wood Preservation
  Stockholm

- IUFRO - International Union of Forest Research Organization
  Vienna

- JICA - Japan International Co-operation Agency
  Tokyo

- OAS - Organization of the American States
  Washington

- RITLA - Red de Informacion Tecnologica Latino Americana
  Rio de Janeiro

- SIDA - Swedish International Development Association
  Stockholm

- UNCSTD - United Nations Center for Science and Technology for Development
  New York

- USAID - United States Agency for International Development
  Washington

- WAITRO - World Association of Industrial and Technological Research Organizations
  Stockholm

VI. SUBJECT AREAS TO BE INCLUDED IN FUTURE CONSULTATIONS

128. By examining the reports of the regional preparatory meetings and the final report of the Consultation it is possible to note that a number of subjects received considerably more attention than others (V. Appendix).

129. Some issues were discussed at length and a consensus of opinion was reached by the final day of the Consultation, so that these issues were adopted as conclusions and recommendations.

130. Among these recommendations there are some that specify subjects to be included in the discussions of the second consultation. These subjects are:

- shipping and transport costs,(item 13.c.);
- strength-grouping of tropical timber and other species from developing countries, and stress-grading rules (item 21.a.);
- secondary wood processing industry, without neglecting the primary industry (item 22).

131. Other subjects of interest to developing countries mentioned in the conclusions and recommendations of the preparatory meetings and of the final Consultation report that may deserve further discussions in the second consultation are:

- identification and mobilization of sources of finance for the establishment of primary and secondary wood processing industries;
- utilization of wood residues for the manufacture of by-products and for energy purposes;
- technical information systems for the wood and wood products industry;

- rural development aspects of the wood and wood products industry;
- low-investment, labor-intensive wood industries;
- joint venture as a tool to the development of the wood and wood products industry;
- standards and quality control procedures as marketing agents for the promotion of wood products in domestic and foreign markets.

VII. CLOSING REMARKS

132. As mentioned in the foreword, this document reflects a personal view of the issues discussed during the Consultation and its preparatory meetings. Because the author is a wood technologist from a forest-rich developing country, the opinions expressed may be expected to be shared by experts with similar experience and background;

133. It should be pointed out again that the methodology of strategic planning was used only as frame of reference in order to achieve the initial objectives of this document. Given the role played by UNIDO in international industrial development and co-operation, the priority guidelines presented were those that the author felt were most pertinent. No effort was made to exaust all the subjects that could be suggested by the analysis of the factors that influence the development of the wood and wood products industry in developing countries.

134. In particular, the aspects related to sylviculture and forest management purposely were not treated in depth, as they relate more to FAO than UNIDO.

135. Finally, it should be explained that the selection of subject areas to be included in future consultations was made according to the most frequent topics mentioned in the conclusions and recommendations agreed upon at the Consultation and its preparatory meetings, as presented in the Appendix. Two of these topics, greater utilization of residues and better dissemination of technical information, were among the three subjects selected during the "First Seminar on the Utilization of Non-traditional Tropical Species", conducted in São Paulo, December 12-14, 1983, under the sponsorship

of OAS; the third preferred subject was the utilization of wood for house construction, which was extensively discussed at the Consultation.

VIII. RELEVANT REFERENCES

A) Documents Related to the Consultation

1. BRION, Horatio P. 1983. Current status and future development of the secondary wood - processing industry of developing countries. First Consultation on the Wood and Wood Products Industry, Helsinki, Finland, 19-23 September 1983. Vienna, UNIDO/FAO. 66p. (Document ID/WG.395/4)

2. FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1982. Management of forest resources in developing of countries. Global Preparatory Meeting for the First Consultation on the Wood and Wood Products Industry, Vienna, Austria, 24-26 January 1983. Vienna, UNIDO. 47p. (Document ID/WG.387/6)

3. HANSON, Oswin Peter. 1983. Promotion of commercially less accepted species. First Consultation on the Wood and Wood Products Industry, Helsinki, Finland, 19-23 September 1983. Vienna, UNIDO/FAO. 40p. (Document ID/WG.395/1)

4. HERRERO PONCE, Reinaldo. 1982. Review of the wood and wood products industry in selected countries of Latin America. Regional Meeting for Latin America in preparation of the First Consultation on the Wood and Wood Products Industry, São Paulo, Brazil, 4-8 October 1982. Vienna, UNIDO. 138p. (Document ID/WG.380/1)

5. MARCHAND; M.H. 1983. Balancing supply and demand worldwide by the year 2000 through resource management. First Consultation on the Wood and Wood Products Industry, Helsinki, Finland, 19-23 September 1983. Vienna, UNIDO/FAO. 65p. (Document ID/WG.395/6)

6. SWIDERSKI, Jozef & HEILBORN, Gotthard. 1983. Mechanical wood processing industries in developing countries: problems causes - search for solutions. First Consultation on the Wood and Wood Products Industry, Helsinki, Finland, 19-23 September 1983. Vienna, UNIDO/FAO. 55p. (Document ID/WG. 395/5)

7. TEJADA, Marcelo. 1983. Promoting the use of wood in construction. First Consultation on the Wood and Wood Products Industry, Helsinki, Finland, 19-23 September 1983. Vienna, UNIDO/FAO. 50p. (Document ID/WG.395/2)

8. UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION. 1982. Report of the Regional Meeting for Africa in preparation of the First Consultation on the Wood and Wood Products Industry. Vienna, Austria, 21-25 June 1982. Vienna, UNIDO. 22p. (Document ID/WG.373/12)

9. UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION. 1982. Report of the Regional Preparatory Meetings for Asia in preparation of the First Consultation on the Wood and Wood Products Industry. Manila, Philippines, 22-26 March 1982. Vienna, UNIDO. 17p. (Document ID/WG.371/16)

10. UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION. 1982. Report of the Regional Meeting for Latin America in preparation of the First Consultation on the Wood and Wood Products Industry, São Paulo, Brazil, 4-8 October 1982. Vienna, UNIDO. 19p. (Document ID/WG.380/13)

11. UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION. 1983. Report of the Global Preparatory Meeting for the First Consultation on the Wood and Wood Products Industry, Vienna, UNIDO. 19p. (Document ID/WG.387/10)

12. UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION/FOOD AND AGRICULTURE ORGANIZATION. 1983. Final Report of the First Consultation on the Wood and Wood Products Industry, Helsinki, Finland, 19-23 September 1983. Vienna, UNIDO/FAO. 38p. (Document ID/WG.395/10)

13. UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION. Sectoral Studies Branch. Division for Industrial Studies. 1983. First world-wide study of the wood and wood processing industries. Vienna, UNIDO. 195p. (Sectoral Studies Series n. 2, UNIDO/IS.398)

14. UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION. Sectoral Studies Branch. Division for Industrial Studies. 1983. A review of technology and technological development and its implications for developing countries. Vienna, UNIDO. 125p. (Sectoral Working Paper Series n. 8, UNIDO/IS.413)

15. UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION. Secretariat. 1983. The development of primary and secondary wood processing industries - Issue Paper n. 1. First Consultation on the Wood and Wood Products Industry, Helsinki, Finland, 19-23 September 1983. Vienna. UNIDO/FAO. 13p. (Document ID/WG.395/7)

16. UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION. Secretariat. 1983. Measures to promote the use of wood and wood products - Issue Paper n. 2. First Consultation on the Wood and Wood Products Industry, Helsinki, Finland, 19-23 September 1983. Vienna, UNIDO/FAO. 15p. (Document ID/WG. 395/8)

B) Other Documents

17. ASSOCIAÇÃO NACIONAL DE FABRICANTES DE PAPEL E CELULOSE. ASSOCIAÇÃO BRASILEIRA DE EXPORTADORES DE CELULOSE. 1980. Diretrizes estratégicas para o setor de Celulose e Papel no Brasil, na década de 80 (original in Portuguese; title: "Strategic policies for the Pulp and Paper Sector in Brazil"). s.l.p. ANFPC, ABCEL: 69p.

18. BANCO INTERAMERICANO DE DESARROLLO. INSTITUTO PARA LA INTEGRACIÓN DE AMERICA LATINA. 1983. Nuevas fuentes de energia: situación y perspectivas de desarrollo y cooperación - informe regional (original in Spanish; title: "New sources of energy: (present) situation and perspectives for development and cooperation - a regional information document"). Buenos Aires, BID-INTAL. 149p.

19. FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1982. World forest products demands and supply 1990 and 2000. Rome, FAO. 346p. (FAO Forestry Paper 29)

20. FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1983. World resources and their use as raw material. Vienna, UNIDO. 177p. (Sectoral Studies Series nº 3, UNIDO/IS.399)

21. GRAY, John W. 1983. Forest revenue systems in developing countries. Rome, FAO. 261p. (FAO Forestry Paper 43)

22. GRUPO DE PLANEJAMENTO ESTRATÉGICO FLORESTAL. 1981. Diretrizes estratégicas para o setor florestal - Brasil florestal: ano 2000 (original in Portuguese; title: "Strategic policies for the forest sector in Brazil"). s.n.t. 77p.

23. HERRERO PONCE, Reinaldo. 1983. Uma análise da indústria de madeira e de produtos de madeira do Estado de São Paulo (original in Portuguese; title: "An analysis of the wood and wood products industry of the State of São Paulo"). Typewritten. 16p.

24. INTER-AMERICAN DEVELOPMENT BANK. 1982. Forest industries development strategy and investment requirements in Latin America. Financing Forest-Based Development in Latin America, Regional Conference, Washington, D.C., June 22-25, 1982. s.l. p., Inter-American Development Bank. 128p. (Technical Report nº 1)

25. ORGANIZACIÓN DE LAS NACIONES UNIDAS PARA LA AGRICULTURA Y LA ALIMENTACIÓN/PROGRAMA DE LAS NACIONES UNIDAS PARA EL MEDIO AMBIENTE. 1981. Los recursos forestales de la America Tropical (original in Spanish; title: "Forest resources of tropical America"). Proyecto de Evaluación de los Recursos Forestales Tropicales (en el marco del SINUVIMA). Roma, FAO. 343p.

26. TAKEUCHI, K. 1983. Economist predicts rise in trade of processed tropical hardwoods. Import/Export wood Purchasing News, Memphis, Tennessee, 10(2):1, 15

27. TEREZO, Evaristo F.M. s.d. Missão comercial aos países da ASEAN - relatório sintético (original in Portuguese; Summary report on the trade mission to the ASEAN countries). Brasília, IBDF. Typewritten. 9p.

28. TRUITT, J. Frederick. 1983. International joint ventures and the Pacific Rim wood industry. Import/Export Wood Purchasing News, Memphis, Tennessee, 10(2):12, 13, 17, 18, 21

29. WORLD BANK. 1978. Forestry sector policy paper. Washington DC, World Bank. 65p.

A P P E N D I X

CONCLUSIONS AND RECOMMENDATIONS OF THE CONSULTATION AND ITS REGIONAL PREPARATORY MEETINGS GROUPED TOGETHER BY SUBJECT AREAS

I. RAW MATERIAL - CONCLUSIONS

ASIA	AFRICA	LATIN AMERICA	CONSULTATION*
- Reduced supplies of logs affect and will affect in the next decades the industry in timber importing countries with limited forest-resources; - Insufficient attention is being given to the harvesting, marketing and use of the commercially less accepted species; - Present regneration, rehabilitation and artorestation efforts are inadequate and need to be considerably increased and forest management techniques improved. Forest plantations have not received enough attention in most of the countries so far, mainly because of financial constraints and lack of knowledge of tropical sylviculture; - Residues in the forests are only marginally used because there is a yet not enough infrastructure and no technology available to make extraction more economical.	- Due to regional imbalances of availabitliy of raw material many countries already face, and will increasingly face in the future, acute shortages of wood both for industrial use and for fuel. This is particularly true in the Sahelian region and North Africa, where the need to secure a steady supply by timber deficit countries will grow with the growth in demand; - So far countries have not yet started to exploit their forests on a long-term sustained-yield basis. Lack of land use planning, forest inventories and proper forest management are limiting factors to a more rational use of forest resources; - With a few exceptions, present regeneration, rehabilitation and afforestation efforts are inadequate and will have to increased in order to compensate deforestation. For many countries they are the only way to meet an increased demand of wood products; - Residues in the forest are only marginally used as a raw material for semi-finished products or for the production of energy or other industrial purposes	- Lack of information on resources (areas, volumes, capacity, etc.) as well as knowledge of commercially less accepted species; - Lack of information on different types and properties of soil, as well as lack, in most of the countries, of adequate land-use policies; - Insufficient afforestation and new plantation programmes to meet the growing deforestation.	I.c.1 The wood sector is important for the economy of the developing countries and their current share in total world production is not commensurate with national resources; II.c.2 A substantial increase of the utilization of the resource base and a better timber economy can be achieved by the promotion of commercially less accepted species, in particular for use in construction and housing; II.c.3 To promote commercially less accepted species the available information on them should be disseminated. Research on the species composition of the forests as well as on the properties of the species should be increased; II.c.4 The greater use of the commercially less accepted species for structural purposes could be encouraged by further consideration of methods of selection of species according to strenght properties and, durability.

* I.c.n (II.c.n) refers to the nth. conclusion of Working Group I (II).

1. RAW MATERIAL - RECOMMENDATIONS

A S I A	A F R I C A	LATIN AMERICA	CONSULTATION *
- Improved management of natural forest resources and logging techniques; - Solving problems related to land use planning, shifting agriculture and fuel wood shortage and decreasing pressures leading to deforestation of vast areas in the region; - Reafforestation and rehabilitation of degraded forest; - Increased use of commercially less-accepted species.	- Management of forests on a long term sustained yield basis and improvement of logging techniques; - Clarification of the status of woodland, reserving areas for permanent forest and solving problems related to pressures which lead to depletion of forests (shifting agriculture, fuel shortage); - Intensive reafforestaion and rehabilitation programmes; - Increased use and promotion of commercially less accepted species; - Making increased use of timber waste and forest residues for energy and processing purposes.	- Develop and apply gradual approach inventories both for the forest resources and for the soil and to colect any other information to rationalize the exploitation of resources; - Increase research on the management of native forests; - Increase and co-ordinate on a regional level research programmes on the indigenous species; - Find adequate means to reinforce the implantations of homogeneous, high productivity and fast growing forests.	- II.r.2 FAO, in co-operation with appropriate international organizations, should increase the dissemination of technical properties of commercially less accepted species and provide the necessary assistance in preparation of forest inventories to determine the available volume of these species.

* II.r.n refer to the nth. recommendation of Working Group II

Underlined phrases refer to the specific subject under consideration

2. PRIMARY AND SECONDARY PROCESSING - CONCLUSIONS

A S I A	A F R I C A	LATIN AMERICA	CONSULTATION*
- The use of residues is considerably lower in developing than in developed countries, due to insufficient integration, lack of a wide enough industrial base and difficulties to market products manufactured from them; - Machinery and equipment are in many cases obsolete and more advanced technology has often proven to be inappropriate, especially in small-scale industries and when employment considerations are taken into account. Maintenance is often insufficient; - There is inadequate number of trained personnel at the skilled, supervisory and management levels as well as the necessary technical support staff (designers, consultants, etc); - Production planning and control are often inadequate.	- Lack of trained manpower at all levels seems to be responsible to a large degree for the low efficiency in factories through inadequately maintained and operated equipment; - Shortage of spare parts due to the lack of foreign exchange and inexistence of local production is a major factor leading to low capacity utilization; - A large part of the existing machinery and equipment is obsolete, and even if new it is very often not adapted to local conditions; - There is a lack of trained middle management so that production planning and quality control are in most cases inadequate; - Ways to reduce costs by use of residues have yet to be applied. Neither the use of residues to produce by-products, nor their recycling for energy is a common practice; - There is a lack of capabilitiesand awareness to plan and design new processing plants and to assist existing factories; - There is a lack of knowledge in timber engineering and standardization for primary and secondary processing.	- Low effective utilizations of the raw material and insufficient development of by-products, as well as low degree of secondary processing; - Lack of support for efficient industrial planning; - Inadequate selection, maintenance, adaptation and development of equipment; - Insufficently trained manpower; - Insufficient technical assistance from governments and international organizations; - Inadequate norms and standards.	- I.c.2 There are advantages to processing raw material close to its source, and developing countries should increasingly engage in primary and secondary wood processing activities; - I.c.5 The establishment of the wood-processing industries in developing countries could be accelerated through innovative forms of international co-operation; - II.c.1 Based on a sustained and increased resource base the development of primary and secondary wood processing industries could promote many important, national objectives such as economic growth, balance of payments, rural development, employment, ecological balance, regional balance and improved standard of living; - II.c.5 The greater use of wood can contribute to national housing programmes in two main ways; the use of prefabricated components by builders and the supply of materials suitable for self-build techniques. In some countries codes and regulations hinder the use of wood for housing. In many cases there is no justification for this if proper specifications and construction methods are employed; - II.c.6 Psychological prejudice against wooden houses exists in many developing countries through the association of the use of wood with proverty and improvised shelter and through fear of fire and decay. Such prejudice could be overcome by development of suitable designs minimizing fire risks and improving durability, and promotion through demonstration projects.

* I.c.n (II.c.n) refers to the nth. conclusion of Working Group I (II)
Underlined phrases refer to the specific subject under consideration

2. PRIMARY AND SECONDARY PROCESSING - RECOMMENDATIONS

A S I A	A F R I C A	LATIN AMERICA	CONSULTATION *
- Integrated processing and better use of residues; - Selection and local production of appropriate machinery and equipment; - Improvement of training at skilled, supervisory and management levels; - Introduction of adequate product standards, quality control, design and timber engineering skills.	- Training of industrial manpower at all levels to increase the supply of sawdoctors, sawmillers, machine operators, maintenance mechanics and electricians as well as practical engineers and designers. Improvement of managerial skills; - Measures oriented towards the increased availability of spare parts and ancilliary material by increasing foreign exchange allocations, finance and promotion of local production; - Establishment of new plants on the basis of their economic viability and directed towards an increased integration in order to make full use of the raw material available; - Increased finance for expansion of industrial capacities and rehabilitation of existing ones; - Introduction of adequate product standards, quality control design and timber engineering skills; - Search for new forms of mutually beneficial contractual arrangements with timber importing countries from the region or outside, taking into account the legitimate interest of producing countries to increase local processing.	- Development of a network of technical information, making use of the existing infrastructure; - Development of products which might permit the utilization of the "lost crops" (residues), for example in the production of energy, panels, etc.; - To develop on a regional level training activities in primary and secondary processing; - To further primary and secondary processing in order to increase local value-added and employment; - Promotion of integrated complexes whenever economic and financial factors permit.	- I.r.4 UNIDO should promote co-operation between member States and in particular between developing countries in the preparation of training manuals that could be translated into vernacular languages, suitable to the needs and educational level of the developing countries concerned; - II.r.3 UNIDO should complete and disseminate information on existing and new uses of wood in construction, especially those suited to the needs and conditions of developing countries and promote demonstrations projects for that purpose; - II.r.4 UNIDO should promote education and training at all levels related to wood technology and the use of wood in construction, in particular training courses for architects and structural engineers from developing countries in order to familiarize them with design practices suitable to their needs in the use of wood for construction; - II.r.6 UNIDO, in co-operation with appropriate bodies, should promote the dissemination of information on the environmental aspects of the wood and wood processing industry, especially with regard to the development of rural areas; General Finally, in the light of the above recommendations, the Consultation recommended that the Industrial Development Board of UNIDO should consider the convening a second consultation on the wood and wood products industry that would, without neglecting the primary industry, emphasize the secondary wood processing industry because (a) it is is far less developed than the primary wood processing industry in developing countries; (b) it can provide for the improvement of living conditions; and (c) it is labour intensive.

* I.r.n (II.r.n) refers to the nth. recommendation of Working Group I (II)
Underlined phrases refer to the specific subject under consideration

3. TRADE TRANSPORT AND MARKETING PROBLEMS - CONCLUSIONS

A S I A	A F R I C A	LATIN AMERICA	CONSULTATION*
- Protectionist restrictions are posed by developed countries by means of tariffs escalating with the level of processing, quotas and other non-tariff barriers; - Freight rates are fixed according to the bargaining power of the parties involved. Conference rates discriminate against exports of processed products; - Shipping services are often insufficiently developed, partly due to poor infrastructure of ports; - Insufficient effective promotion activities due to inaccurate or lack of marketing data and information as well as inadquate marketing channels affect the capacity to operate in the international market; - Commercially less-accepted species are insufficiently promoted and sufficient provision has not been made to allow for their use in existing standards and building specifications; - For secondary wood products there is a lack of standards and codes of practice. Furthermore, there is a lack of sufficient human resources for design of products and timber engineering.	- So far African countries have not been able to establish their own marketing chains; and efforts to have a coordinated production and pricing policy for exports of wood based products vis-à-vis consuming countries have not been successful; - Commercially less accepted species are insufficiently promoted and sufficient provision has not yet been made in existing standards and building specification to allow for their local use; - Freight rates are extremely high and the countries' possibilities to influence their fixation and share the benefits are reduced. Part of the high shipping costs are due to poor infrastructure of ports and lack of coordination of shipments; - Inland transport costs are extremely high due to the lack of adequate road, rail and river systems; - Local markets within economic transportation distance are limited.	- The market of wood importing countries is excessively protected in the case of manufatured products. The existing tariff barriers, as well as non-tariff barriers in the form of quality and phytosanitary requirements, hamper international trade; - In general, Latin American countries have only a short experience in production and marketing which limits the offer of processed wood to small volumes and is also the cause of the lack of regularity of deliveries; - The domestic market of Latin American countries is very limited and its development is mainly hampered by deficiencies in the promotion and the existence of prejudices on behalf of the consummer against wood; - There is a lack of information about the actual situation and tendencies of the international market and this limits the possibilities of increasing sales and also the possility of diversifying exports with new species and products; - The countries of the region do not have efficient marketing systems to allow them to promote, maintain and increase sales; - High freight rates of conference lines; - Lack of transport infrastructure: roads, ports, railways, etc.; - Unnecessary transport of residues, water, etc.	I.c.4. Other constraints encountered by partners are the frequent lack of transportation infrastructure and managerial and skilled labour at all levels, as well as conditions for projet identification and implementation, which affect the development of the sector; II.c.7 Developing countries encounter difficulties in enlarging their share of world trade in wood and wood products due to, among other factors, tariff and non-tariff barriers, the lack of adequate marketing information, high freight rates and lack of standardization.

* I.c.n (II.c.n) refers to the nth. conclusion of Working Group I (II)

Underlined phrases refer to the specific subject under consideration

3. TRADE TRANSPORT AND MARKETING PROBLEMS - RECOMMENDATIONS

A S I A	A F R I C A	LATIN AMERICA	CONSULTATION*
- Abolition of protectionist policies by developed countries; - Coordinated policies in shipping; - Improvement of marketing through regional efforts or joint-ventures and innovative marketing arrangements.	- Improvement of marketing channels and increased awareness of the market situation as well as coordination of export policies; - Reduction of shipping costs by means of more active participation in the fixation of freight rates, innovative shipping arrangements as well as improvement of port facilities and operations; - Abolition of protectionis policies in developed countries and improved competition by standardization of products.	- Exporting countries should initiate actions in order to obtain the abolition of the restrictive measures which prevail at present in the international trade of wood and wood products; - The countries of the region should increase their efforts to strengthen the domestic markets by means of the opening of potentially important lines like for example the building of wooden houses; - It was agreed that it is important to start the search of new markets and to increase the existing ones by means of the promotion of new species and wooden products as well as the development of adequate norms and standards and adoption of common grading rules; - It was agreed to support the efforts which on international co-operation of the wood industries are being undertaken by UNCTAD in co-operation with other international organizations; - It was agreed to increase the efforts towards the improvement of the present marketing structures as well as to support the efforts of producers and exporters to get associated in groups; - Improvement of transport infrastructure; - Identification and design of new methods to reduce transport costs; - Regional co-ordination of policies vis-à-vis Conferences.	II.r.3 UNIDO should give priority to an in-depth study of shipping and transport in view of the high impact that these costs have on the price of the products in the domestic market and on the export earning derived from wood products; the results of that study should be presented to a second consultation on the wood and wood products industry; II.r.5 UNIDO, in co-operation with the appropriate United Nations bodies, should initiate specific studies related to the participation of developing countries in the world trade of wood and wood products on the technical requirements that affect the import of wood and wood products; and UNIDO should request ITC-UNCTAD/GATT to provide and disseminate market information to increase the sale of wood and wood products.

* II.r.n refers to the nth. recommendation of Working Group II

4. FINANCE - CONCLUSIONS

A S I A	A F R I C A	LATIN AMERICA	CONSULTATION*
Financial assistance is inadequate for: - forest regeneration and rehabilitation activities - infrastructure - expansion of processing facilities and acquisition of more advanced processing technology - research and development - training at all levels	Financial assistance is inadequate for: - forest regeneration and rehabilitation activities - development and physical infrastructure - preparation of investment studies (prefeasibility and feasibility studies) - expansion of processing facilities and acquisition of more advanced processing technology Not enough finance is available in terms of soft loans or seed money for this industry although it is labour-intensive and resource based	There is inadequate finance for the wood industry like for: - prefeasibility and feasibility studies - reforestation and genetic improvement programmes - expansion of industrial capacities and development of infrastructure - manpower training - stocks	I.c.3 Among the constraints faced the developing countries, obtaining finance for the establishment of processing plants is a major difficulty

* I.c.n refer to the nth. conclusion of Working Group I

4. FINANCE - RECOMMENDATIONS

A S I A	A F R I C A	LATIN AMERICA	CONSULTATION
(No specific recommendation)	(No specific recommendation)	The meeting concurred on the necessity to overcome the financial constraints to the development of the wood and wood industry in Latin America in co-operation with concerned international organizations	(No specific recommendation)

5. TECHNOLOGY, RESEARCH AND DEVELOPMENT - CONCLUSIONS

A S I A	A F R I C A	LATIN AMERICA	CONSULTATION*
- Adequate channels to disseminate information in hte region and of fora to discuss work in progress are lacking; - Research activitires in problems related to the use of residues and commercially less-accepted species have not been given the priority they deserve; - Inadequate research and development programs aimed at solving problems of the industry.	- In spite of the availability of processing equipment designed for tropical species, too often the wrong equipment is installed. Also, the degree of sophistication is tno always adapted to local conditions in terms of availability of spare parts and maintenance services; - Enterprises from developed countries are sometimes tempted to promote exports of obsolete machinery to African countries, for which spare parts are not available and this does not help them to become competitive; - Technological change is sometimes thought to be positive <u>per se</u> without taking into account economic, social, ecological and climatic considerations.	- Lack of information about existing equipment as well as devel opment and transfer of appropriate technologies; - Lack of research for the better use of indigenous species as well as development or adaptation of appropriate equipment and technology; - Lack of an effective regional system of consultancy, engineering services, and technical assistance to industry; - Lack of an effective system of technology and scientific information and documentation to support research and development activities at a regional level.	I.c.7 Whereas a considerable number of <u>research and development institutes</u> in both developing and developed countries are active in the wood sector, there is considerable scope for enhancing collaboration to ensure the <u>fuller use of existing facilities and resources at all levels</u>; I.c.8 Although a considerable amount of information resulting from research, technological developments etc. existis, there are serious shortcomings in its format and dissemination to potential users.

* I.c.n refers to the nth. conclusion of Working Group I

Underlined phrases refer to the specific subject under consideration

5. TECHNOLOGY, RESEARCH AND DEVELOPMENT - RECOMMENDATIONS

ASIA	AFRICA	LATIN AMERICA	CONSULTATION*
(No specific recommendation)	(No specific recommendation)	- To establish effective systems for the dissemination of information, transfer of technology and technical assistance to industry; - To establish research and development programmes for the integral use of resources, the development of appropriate equipment and technology in co-operation with private enterprise; - To promote the local production of equipment and ancillary material; - To support the development of technologies which make intensive use of wood like those oriented towards the use of wood in construction and housing.	I.r.2 UNIDO should identify, in collaboration with other international bodies, the existing facilities and availability of specialized research and development institutions in both developed and developing countries and identify areas of existing and potential co-operation between them, for example, through twnining arrangements, to ensure a full utilization of natural resources in the developing countries; I.r.5 UNIDO should direct its activities, in collaboration with FAO and UNCTAD, to develop the regional and global information base necessary for the development of the wood and wood processing industries, particularly in developing countries; II.r.1 UNIDO, in co-operation with appropriate international organizations, should examine the possibility of developing and internationally acceptable strength-grouping system for tropical timber and other species from developing countries used for structural purposes and of stress-grading rules. These results to be presented to national bodies as soon as possible and to a possible second consultation on the wood and wood produts industry II.r.2 FAO, in co-operation with appropriate international organizations, should increase the dissemination of available information and results of research on technica properties of commercially less accepted species and provide the necessary assistance in preparation of forest inventories to determine the available volume of these species; II.r.4 UNIDO should promote education and training at all levels related to wood technology and the use of wood in construction, in particular training courses for architects and structural engineers from developing countries in order to familiarize them with design practices suitable to their needs in the use of wood for construction.

* I.r.n (II.r.n) refers to the nth. recommendation of Working Group I (II)
Underlined phrases refer to the specific subject under consideration

6. INDUSTRIAL INFRASTRUCTURE - CONCLUSIONS

A S I A	A F R I C A	LATIN AMERICA	CONSULTATION *
(No specific conclusions)	- Adequate channels to disseminate information on research and development in the region and fora to discuss work in progress are lacking; - Many research institutions seem to be still directed from abroad and do not disseminate information adequately; - A uniform nomenclature and classification for existing species is still lacking and efforts on grading have been insufficient; - Not enough has been done so far on training activities to coordinate the existing efforts and to specialise existing institutions; - Statistics on production of forest products and on primary and secondary products are lacking; - There are insufficient industry associations as well as trade and marketing associations at national and regional level; - Standardization institutes are lacking.	- Lack of trained manpower at all levels; - Deficient or inexistent systems of information about technologies, markets, resources, etc.; - Safety and health conditions in industry.	I.c.4 Other constraints encountered by parners are the frequent lack of transportation infrastructure and managerial and skilled labour at all levels, as well as conditions for project identification and implementation, which affect the development of the sector; I.c.6 Training programmes should be aimed at satisfying the precise needs of industry at all levels. Such training should be given as close as possible to the raw material source and should take into account the level of knowledge of the trainees and of the technology in the country concerned. Furthermore, industry-oriented training increases job safety and productivity of the operation; II.c.7 Developing countries encounter difficulties in enlarging their share of world trade in wood and wood products due to, among other factors, tariff and non-tariff barriers, the lack of adequate marketing information, high freight rates and lack of standardization.

* I.c.n (II c.n) refers to the nth. conclusion of Working Group I (II)

Underlined phrases refer to the specific subject under consideration

6. INDUSTRIAL INFRASTRUCTURE - RECOMMENDATIONS

A S I A	A F R I C A	LATIN AMERICA	CONSULTATION*
(No specific recommendation)	(No specific recommendation)	- Development of manpower training programmes; - Development of an effective system of technical information for the development of the sector - Development of a regional organization of the wood industry to increase co-operation among industrialists of this sector in the region	I.r.4 UNIDO to promote co-operation between member States and in particular between developing countries in the preparation of training manuals that could be translated into vernacular tongues, suitable to the needs and educational level of the developing countries concerned; I.r.5 UNIDO should direct its activities, in collaboration with FAO and UNCTAD, to develop the regional and global information base necessary for the development of the wood and wood processing industries, particularly in developing countries.

* I.r.n refers to the nth. recommendations of Working Group I
Underlined phrases refer to the specific subject under consideration

7. REDEPLOYMENT OF INDUSTRY AND INTERNATIONAL AND REGIONAL COOPERATION - CONCLUSIONS

A S I A	A F R I C A	LATIN AMERICA	CONSULTATION *
- Lack of adequate long-term arrangements between timber exporting and importing countries to regulate supplies of input material for industry in unprocessed and semi-processed form; - A need to solve production, marketing and tranport problems through joint-ventures or other contractual arrangements between developed and developing countries or at a regional level; - Insufficient local production of appropriate equipment for the region; - Need for more cooperative efforts in training and deployment of available manpower; - A need for better use of existing processing facilities.	(No specific conclusion)	- Lack of harmonization of efforts and objectives on research regarding forest resources and products as well as the development and adaptation of equipment and technologies; - Lack of harmonization in the extension and technical assistance programmes for industry; - Lack of regional co-operative programmes on manpower training; - Lack of an effective regional monitoring system of the regional and international wood market and of its competitive products; - Lack of a regional system of information and documentation on resources, products, equipment, technologies, statistics, etc.	I.c.5 The establishment of the wood-processing industries in developing countries could be accelerated through innovative forms of international co-operation. I.c.7 Whereas a considerable number of research and development institutes in both developing and developed countries are active in the wood sector, there is considerable scope for enhancing collaboration to ensure the fuller use of existing facilities and resources at all levels. I.c.8 Although a considerable amount of information resulting from research, technological developments etc. existis, there are serious shortcomings in its format and dissemination to potential users.

* I.c.n refers to the nth. conclusion of Working Group I

Underlined phrases refer to the specific subject under consideration

7. REDEPLOYMENT OF INDUSTRY AND INTERNATIONAL AND REGIONAL COOPERATION - RECOMMENDATIONS

A S I A	A F R I C A	LATIN AMERICA	CONSULTATION *
- Long-term arrangements for the supply of input materials for industry in timber importing countries for further processing; - Establishment of mutually beneficial contractual arrangements among developing countries or between developed and developing countries to solve production, marketing and transport problem for all products; - Promotion of the local production of machinery and ancillary materials and equipment; - Coordination of training and research and development activities on a regional basis through a more rational use of existing facilities at national level.	- Long-term arrangements for the supply of input materials for further processing; - Establishement of mutually beneficial contractual arrangements between timber importing and timber producing countries to solve production, marketing and transport problems for all products; - Coordination of training and research and development activities on a regional basis through a more rational use of existing facilities at national and regional level.	- Development and implementation of the regional system of technical information and documentation on resources, products, markets, equipment and technologies as a fundamental instrument for the sector; - Development of manpower training and research and development programmes based on the utilization and co-ordination of existing infrastructure at a regional level; - Development of co-operative regional programmes for extension and technical assistance for the wood industry; - Development of a co-operative system between industry and state organizations and research and training centers in order to harmonize efforts to support the development of the wood industry in the region.	I.r.1 UNIDO should develop, in co-operation with a panel of international experts, taking into account the work of international organizations such as UNCITRAL, UNCTAD and ATIBT (Association Technique Internationale des Bois Tropicaux), contractual checklists for the elaboration of long-term collaboration arrangements in joint ventures, provision of know-how, training, management, marketing, etc.; I.r.4 Promote co-operation between member States and in particular between developing countries in the preparation of training manuals that could be translated into vernacular tongues, suitable to the needs and educational level of the developing countries concerned; I.r.5 UNIDO should direct its activities, in collaboration with FAO and UNCTAD, to develop the regional and global information base necessary for the development of the wood and processing industries, particularly in developing countries.

* I.r.n refers to the nth. recommendation of Working Group I
Underlined phrases refer to the specific subject under consideration