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18591

Forest and Wood Products, 1987/1988

COOPERATION AND COLLABORATION IN FOREST PRODUCTS RESEARCH

Opportunities For Collaborative Arrangements
Among Research Institutions

Prepared for United Nations Industrial Development Organization

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5/2/90

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September 1990

Summary

This reports on an effort by UNIDO, with assistance of IUFRO, to determine possibilities for collaboration between developing and developed country forest products research institutions. The objective is to increase the contribution to development of research institutions in the developing countries. It follows from UNIDO's First Consultation on the Wood and Wood Products Industry, held in Helsinki, Finland, in 1983. Results from a written survey and a meeting at the IUFRO World Congress, Montreal, Canada, indicate a strong interest in international collaboration on the part of both developed and developing country institutions.

No specific twinning or other collaborative arrangements were accomplished in this study, but opportunities and requirements for doing so were clarified. A database of research needs, capabilities, and collaborative interests was begun. The database needs to be expanded, revised periodically, and made readily accessible as a means of "mating" institutions with mutual concerns and complementary capabilities. The information gathered will provide a nucleus for this.

A critical need is access to international donor agencies for financial support. A beginning IUFRO effort to establish a database of donor profiles and application procedures, together with databases on training opportunities, consultants, and research programs, will contribute strongly toward meeting this need.

The IUFRO research group/working party structure can provide a basis for bringing together researchers from developed and developing country institutions to identify areas for collaborative research. Regional programs developed through IUFRO for improved utilization of timber resources in the developing world will provide program guidance for integrating efforts to solve technical problems of the forest industry.

Introduction

Recent years have seen two parallel developments in utilization of timber resources from the developing world. One is an awareness that timber resources of the natural forests of the developing world are limited and that the manner of their management, use, and conservation can have profound social, environmental, and economic effects. This has led to responses that vary from outright ban on logging and export to encouragement of primary and secondary domestic forest industries to continued export of logs for foreign exchange and increased attention to culture and use of plantation species. The other is an increased awareness of forest products research institutions in the developing world, most of them struggling to enlist skilled personnel and procure adequate facilities and operating funds under conditions of political instability and economic uncertainty.

Effective functioning of the forest products research institutions in the developing world could have a strong beneficial effect in improving the contribution of forest resources, natural or planted, to the social and economic development of their nations. Ultimately, strong political and financial support as well as agreement on needs and priorities will be needed domestically to enhance the development and contributions of such institutions in strengthening their role in wise use of the forest resource. However, until the research institutions can develop to an effective functioning level, neither such support nor such agreement is likely to develop.

The Situation

Forest products research institutions in the industrialized world have the capability and the research resources to help overcome this problem. The need for and value of doing so have been pointed out from several sources during recent years. Results of a specific study to identify the roles and potentials of industrialized and developing country forestry research institutions were presented at the IUFRO World Congress in Kyoto, Japan (World Bank, FAO 1981). That report, based on a survey of research institutions in both the industrialized world and the developing world, strongly promoted the concept of twinning and other forms of international collaboration.

Agricultural research institutions around the world have faced a similar situation. International assistance organizations concerned with agricultural research have generally been moving faster toward international cooperation than have those in forestry research. This is no doubt related to the emphasis given to agriculture in international development assistance programs. International agricultural research institutions, such as the International Rice Research Institute (IRRI) in the Philippines and the Centro Internacional de Mejoramiento de Maiz Y Traigo (CIMMYT) in Mexico, have developed from these efforts, under the guidance of the Consultative Group for International Agricultural Research (CGIAR). Also, specific ties have developed between agricultural research institutions in developing and industrialized nations.

International cooperation in forestry research has been encouraged in recent years by efforts such as the Special Program for Developing Countries of the International Union of Forestry Research Organizations (IUFRO)

and the Tropical Forestry Action Plan of several international forestry organizations. These efforts have emphasized collaboration and networking among developing country institutions as well as ties to research institutions in the industrialized world. Most emphasis has been given to selection, care, and cultivation of trees for a variety of uses, with research planning and implementation in many parts of the developing world. Programs aimed at improved utilization of timber resources have been developed in Latin America, Southeast Asia, and Africa, but implementation has been slow and spotty due to limited financial and political support.

The UNIDO/IUFRO Effort

The effort by the United Nations Industrial Development Organization (UNIDO) and IUFRO to bring together forestry research institutions in developed and developing countries stems directly from UNIDO's First Consultation on the Wood and Wood Products Industry, held in Helsinki, Finland, 19-23 September 1983. That consultation extended to the wood and wood products industry a system of consultations sponsored by UNIDO for many key industries with the objective of raising the share of the developing countries in world industrial output through increased international cooperation.

One of the Recommendations of that consultation (13b) was that 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 cooperation between them, for example, through twinning arrangements, to ensure a full utilization of natural resources in the developing countries."

To implement that recommendation, a survey form was developed (Annex 1) and sent to research institutions throughout the world that could be identified by listings of such broadly-based organizations as FAO and IUFRO. About 100 of those were returned and entered into a computerized database at UNIDO headquarters in Vienna, Austria. Forty of those indicated specific interest in twinning arrangements -- 27 from developed countries and 13 from developing countries. In addition, 24 persons interested in the subject met at the IUFRO World Congress in Montreal, Canada. Half of those were from developing countries and five were from institutions that had previously returned the survey forms to UNIDO.

Results

Review of the returned survey forms indicated strong interest in twinning or other forms of international cooperation. This interest is probably much underestimated by the limited data. The tenor of the discussion during the meeting in Montreal indicated the same. However, since most of those at the Montreal meeting were from institutions that had not had the survey form, participants were not prepared to make specific arrangements.

Many of the institutions responding to the survey or represented at the meeting have been supported to some degree by international donor agencies. International cooperation in some form is not a new idea to them, though the concept of twinning or other international collaboration does not seem to have been applied to any appreciable extent. Such efforts as have been carried forward in the developing world generally have not been well organ-

ized to meet reasonable goals in improved utilization of timber resources with the best talent and facilities available and have not been funded consistently enough to enhance the long-term commitment needed for real progress.

While subjects of strongest interest and potential at the responding research institutions range rather widely across fields significant to the forest industry, the greatest concentration seems to be in timber harvesting, general areas of timber utilization, and efficiency of timber processing. These are all areas that can contribute strongly to the effective development of forest industry and wise use of forest resources. Each of them represents a rather broad area that includes several specific areas of value and interest for research and development.

There is little evidence of forest products research institutions, especially those in the developing world, working to meet research needs as identified in a comprehensive national or regional plan. In most cases, funding levels are not adequate for sustained, directed programs, and staff skills and facilities are not sufficient to support and carry forward such programs effectively.

Discussion

Database Needs

There is a strong need for a central "clearing house" for information on research institutes looking for international cooperation opportunities to assist in bringing them together with others having mutual needs and interests. This should also serve to bring them together with donor agencies that may be in a position to provide funding support. Two of the institutions represented at the Montreal meeting agreed to help with this -- the Forest Engineering Research Institute of Canada and the Forest Products Laboratory (Madison, WI, USA). That help could be very useful in developing further research associations among those who have responded to the UNIDO survey or participated in the Montreal meeting. For the longer run and more comprehensive use, however, a more specialized effort will be needed, such as that being undertaken by the Special Program for Developing Countries (SPDC) of IUFRO. That group at IUFRO Secretariat in Vienna is setting out to establish databases that will provide the following types of information:

- Names and addresses of contacts in donor agencies
- Subject areas and geographic preferences of donor agencies
- Rules for submission of grant requests and project proposals to donor agencies
- Regularly-offered training courses
- Forestry research programs and projects
- Sources of literature
- Names and addresses of consultants with experience in developing countries

Some will be developed de novo and others will be borrowed or adapted from other sources.

The IUFRO SPDC is making efforts to access additional databases, such as the Canadian IDRIS database and the US FORIS database to add to the type of information described above. The Technical Advisory Committee of the CGIAR is proposing to include access to additional databases for entry of

forestry, agroforestry, and forest products (to a limited degree at this point) into the CG System.

FAO, with the assistance of UNDP, has prepared a compendium outlining multilateral and bilateral grant and loan assistance to the forestry sector in developing countries (FAO 1986). This lists source of assistance and area of project activity by country and region. The main objective of the compendium is to improve cooperation among development agencies. It is not well adapted to bringing research institutes together or to establishing contact with donor agencies.

The database developments cited are all important to building a strong, effective working base for international collaboration in forestry research. They will require substantial skilled effort to establish and maintain in a current condition, so they will be expensive. Presumably, the "Forestry programs and projects" database will ultimately be able to function as the "clearing house" I mentioned above and should include up-to-date information of the type gathered in the UNIDO survey. This in itself, broadened in geographic scope, will require a major dedicated effort with excellent computer facilities.

The expanding membership in IUFRO can provide an essential supplement and working base for this. One major result of the IUFRO SPDC has been to bring many developing country forestry research institutions into active participation in IUFRO research groups and working parties. This can be a most effective means of bringing them into contact with developed country scientists in their field and bringing to the attention of a broad research community the needs and opportunities for collaborative research.

Program Direction, Content, and Priorities

Program direction, content, and priorities need to be identified systematically by developing country researchers and resource and industry officials as a basis for integrating the efforts of research institutions and presenting the needs and approaches to donor agencies. This will help focus limited research resources on most critical needs, bring together scarce staff skills and facilities from research institutes with mutual needs and concerns, and assure donor agencies that program details have been worked out on the basis of broad consideration of problems and needs.

Some efforts have been made to do this at both the general and the more specific levels. General guidance has been provided by such documents as The Tropical Forestry Action Plan (FAO 1985), which has a chapter on forest industry development, and Tropical Forests: A Call for Action (World Resources Institute, World Bank, UNDP 1985), which has country investment profiles that vary from rather general to moderately specific. The Tropical Forestry Action Plan is being implemented through more detailed planning, but there is little evidence of emphasis on the needs of the forest industry.

More closely focussed on the forest industry were programs developed through the efforts of IUFRO Project Group P5.01 (Properties and Uses of Tropical Woods). These include programs developed by and for research institutions in South America (DeFreitas et als 1986) and in Southeast Asia (Kauman et als 1987), as well as a program being developed by and for institutions in Africa based on a workshop held in Abidjan, Cote d'Ivoire, in November 1989. These latter were designed to form the basis of research networks, similar to other workshops of the SPDC dealing with multi-purpose tree species and related matters, and to yield documented research packages

amenable to funding by donor agencies.

The IUFRO efforts have not been confined to seeking collaboration between developed and developing world institutions. Rather, the basic thrust has been to put the primary planning and execution responsibility on the developing world institutions, with such assistance from developed world institutions as may be useful and necessary to take advantage of more refined facilities and skilled research staff. Generally, the operating groups will be networks of developing country institutions with one of them taking the lead for each part of the program. Here also, availability of funding has been a primary deterrent to progress in meeting identified needs.

Funding Needs

Funding for each of the programs mentioned above runs into millions of dollars. The sheer size of these programs may be a deterrent to funding by international assistance agencies, so it is clear that small units need to be taken from them and adapted to the specific needs identified. At the same time, the integration needed to keep those units as additive parts of a desired whole must be maintained.

International donor agencies are generally more prepared to support those aspects of forestry related to improving, growing, and protecting trees than those aspects of forestry related to wise and efficient use of the timber resource (FAO 1986). This is, in my view, related to (1) the fact that it is easy to comprehend the many benefits of a forest, which include environmental and biological, as well as economic material benefits, and (2) the impression that it is primarily the forest industry that profits from use of the resource, therefore the industry should support research and development activities that improve such use. Forest-based industries, even the small-scale industries that are most common in developing countries, provide economic incentive for management of the resource, employment, training in industry management and technical skills, income where people and resources are, indigenous entrepreneurial development, smoothing for seasonal production/income cycles in rural areas, and goods and services to strata of society often not reached by other sources and industries. They must be profitable for sustained operation and have been shown to be so when operated properly (Fisseha, in FAO 1987). They are worth assisting through research, development, and application of technology. The effort to convince donor agencies of these benefits that go far beyond the industry itself may be a difficult one and could be a first substantial part of the international collaboration effort.

It should be noted, however, that technology alone is not sufficient to insure success of forest industries. Other factors that require attention are raw material availability, access to finance, managerial and entrepreneurial capability of the leaders, infrastructure adequacy and availability, the market for the product, access to that market and strategy for entering it, and ability to match product characteristics to market needs.

Recommendations

1. Support the establishment and maintenance of an internationally accessible database that will assist in bringing together research institutes with complementary needs and mutual interests.

2. Support the establishment and maintenance of databases that will profile potential donors and provide information on application procedures, training opportunities, consultants, and literature.
3. Encourage IUFRO research groups and working parties in specific areas of forest products research to identify research needs and potential collaborators in developing countries.
4. Concentrate on areas of needed research, development, and application identified in regional and national workshops of developing country researchers and resource and industry managers under the broad international guidance.
5. Encourage formation and operation of research and development networks based regionally and nationally in the developing world. Assist them in technology transfer and application techniques to increase the likelihood that research is designed to solve real problems and results are applied to effect practical solutions.
6. Develop rationale for encouraging international donor agencies to support research, development, and application basic to strengthening the role of the forest industries in developing countries in ways that are consistent with sound resource use and improvement of the socio-economic status of the people concerned.

Literature Cited

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QUESTIONNAIRE

Co-operative arrangements among R and D institutions

(Sector: Improved Timber Utilization)

1. Country

2. Name of institution			3. Acronym
4. Address in full			
5a. Cable	5b. Telephone	5c. Telex	5d. Telefax
6. Director/Head	7. Contact person(s)	8. Total number of professional staff	
9a. Approximate budget in 1989 (give approximate equivalent in US\$)		9b. Source of funds	
10. Relation with other organization(s) (please indicate relation(s) with particular governmental organization(s), private enterprise(s), etc.)			

1. Please list your former projects *) (field of activity and project title) according to the following classification and by means of the code-numbers from Table 1:

R e s e a r c h		T r a i n i n g	
Field (in code number)	Project title	Field (in code number)	Project title

*) Carried out during the last four years

= =

12. Please list your ongoing projects (field of activity and project title) according to the following classification and by means of the code-numbers from Table 1:

R e s e a r c h		T r a i n i n g	
Field (in code number)	Project title	Field (in code number)	Project title

13. Please list your anticipated projects (field of activity and project title) according to the following classification and by means of the code-numbers from Table 1:

R e s e a r c h		T r a i n i n g	
Field (in code number)	Project title	Field (in code number)	Project title

14. Availability of pilot installation or equipment: YES [] NO []

If YES, please fill in the following table with the suitable code-number:

EXTENT OF OPERATION	PURPOSE OF OPERATION		
	Research	Training	Industrial application
For technical co-operation			
For technical assistance			
For own use			

15. Technical co-operation given

15a. Availability of your staff as consultants or experts for UNIDO field assignments:

15b. Availability of organizing training programme at your institute or organization: for own nationals:

YES [] NO []

for other nationals:

YES [] NO []

If YES, please explain details of possible programme:

Field (in code-number)	Duration	Language(s)

16. Technical co-operation offered or requested

16a. Immediate technical co-operation offered to or requested from international organizations or other countries:

(i) Training

(Do you offer training to fellows from developing countries?) YES [] NO []
 (Do you need your staff trained overseas?) YES [] NO []

(ii) Experts

(Do you offer consultants to work in developing countries?) YES [] NO []
 (Do you need experts from overseas?) YES [] NO []

(iii) Equipment

(Do you offer equipment?) YES [] NO []
 (Do you need equipment from overseas?) YES [] NO []

If YES, please specify:

Field (in code-number)			Duration	Language(s)
Training	Experts	Equipment		

16b. Are you interested in "twinning" with an institution in another country? YES [] NO []

(i) Any specific institution? _____

(ii) Specific field(s) of cooperation _____

16c. Any assistance obtained in the past:

(i) from bilateral co-operation: YES [] NO []

If YES, please specify (from whom): _____

(ii) from international organization: YES [] NO []

If YES, please specify (from whom): _____

17. Publications

Enclosed herewith		Type of publication	Title	Avail	Language of publication(s)	UPD
YES	No					
		Brochure				
		Dissertation				
		Newsletter				
		Project document				
		Report				
		Other				

AVAIL - Availability of publication(s)

D - Distribution on request

S - For sale

UPD - Update frequency

Y - Every year

Q - Every three months

M - Every month

O - Other (in this case, please specify)

Table 1. ACTIVITIES IN TIMBER UTILIZATION IMPROVEMENT

<u>Technology</u>	Native spp. esp. CLAS	Plantation spp.
Harvesting		
-Interface with silviculture	C1	P1
-Methods and machines	C2	P2
-Protection of logs	C3	P3
-Protection of environment	C4	P4
Utilization of Timber Resource		
-Catalogue existing data on properties, supply, and wood quality	C5	P5
-Adapt methods for screening, grading, testing, grouping	C6	P6
-Determine wood properties	C7	P7
-Determine inventory of timber	C8	P8
-Develop end-use criteria	C9	P9
-Identify appropriate technology for different situations	C10	P10
Processing of Timber Resource		
-Sawmilling	C11	P11
-Grading	C12	P12
-Machining	C13	P13
-Drying	C14	P14
-Solar drying	C14a	P14a
-Preservation	C15	P15
-Low cost methods	C15a	P15a
-Indigenous preservatives	C15b	P15b
-Fire protection	C16	P16
-Gluing & Adhesives	C17	P17
-Non traditional (tannin etc)	C17a	P17a
-Finishing	C18	P18
-Panels	C19	P19
-Furniture	C20	P20
-Mouldings	C21	P21
-Automation, CAD, CAM	C22	P22
-Chemicals and pharmaceuticals	C23	P23
-Plant operation	C24	P24
Utilization Efficiency		
-Reduce harvesting residues	C25	P25
-Reduce processing residues	C26	P26
-Develop co-products from residues	C27	P27
Ecology		
-Disposal of unavoidable residues	C28	P28
-Control of emissions and effluents	C29	P29
-Environmentally friendly additives (preservatives, finishes, etc.)	C30	P30

Utilization of Special Species	Rubberwood	Bamboo	Rattan
-Overcome manufacturing problems	R1	B1	T1
-Develop quality criteria	R2	B2	T2
-Develop quality control methods	R3	B3	T3
-Develop new products	R4	B4	T4
-Lesser-known rattans/bamboos		B5	T5

Utilization of Palmwood	Oil palm	Coconut & other
-Determine properties	01	U1
-Structural materials and designs	02	U2
-Design small remote conversion plants	03	U3

Improve housing	
-Develop building components and structural systems	H1
-Adapt to cottage industries and rural use	H2
-Promote joint projects with building enterprises	H3
-Design and build prototype houses	H3
-Prepare and disseminate design manuals	H4
-Develop timber grading rules	H5

Improve Use of Wood for Energy	Domestic	Industrial
-Solid wood, chips, residues	DE1	IE1
-Charcoal, carbon, activated carbon	DE2	IE2
-Liquid fuels	DE3	IE3
-Gaseous fuels	DE4	IE4
-Small scale energy systems from wood and agricultural wastes	DE5	IE5

<u>Management/Technology</u>	Material	Processing	Distribution
-Economics	MM1	MP1	MD1
-Energy use	MM2	MP2	MD2
-Environmental Control	MM3	MP3	MD3
-Manpower and safety	MM4	MP4	MD4
-Product marketing	MM5	MP5	MD5
-Technology transfer	MM6	MP6	MD6

<u>Non-Wood Forest Products</u>			
-Gums	NW1	NP1	ND1
-Resins	NW2	NP2	ND2
-Medicinal plants	NW3	NP3	ND3
-Other	NW4	NP4	ND4

Other Areas of Cooperation that seem especially important to you but are not covered above: