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REPORT ON THE FOREST SECTOR PROJECT
NETWORK MEETING
29 August - 2 September, 1983
Sopron, Hungary

Clark Row*

October 1983
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International Institute for Applied Systems Analysis

FOREST SECTOR PROJECT

NETWORK MEETING

29 August -- 2 September, 1983

Sopron, Hungary

Meeting report

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IIASA FOREST SECTOR PROJECT

1983 Network Meeting Summary

Clark Row

USA

1. Introduction

As at the two previous network meetings, the 1983 Forest Sector Project Network Meeting summarized the accomplishments of the Project, both by the staff at IIASA in Laxenburg, Austria, and by the national teams in collaborating countries. Also discussed were options for future effort (particularly for further development of the global forest trade model), data required to be assembled and analyzed, and other Forest Sector Project affairs. A detailed agenda is listed in Appendix A.

The network meeting was attended by 39 participants from 13 of the collaborating countries and from cooperating organizations (Food and Agriculture Organization of United Nations (FAO), United Nations Industrial Development Organization (UNIDO), and Jaakko Poyry International Oy). Eight members of IIASA's Forest Sector Project and other units participated. A list of participants is given in Appendix B.

Unlike other network meetings, the meeting was held in Sopron, Hungary, because accommodations were unexpectedly scarce near Vienna. The participants were appreciative of the gracious

and generous hospitality of our hosts, the Hungarian Committee for Applied Systems Analysis.

Formal presentations are only part of what happens at any coordinating meeting. Questions and comments during the meeting, conversations at breaks and meals, distribution of papers by those that could not attend, and separate meetings on special topics all contributed to accomplishments. This report attempts to summarize the meeting as a whole.

2. Project status

2.1. Accomplishments and plans

As Project Director Markku Kallio pointed out in his initial "Status Report and Research Plan for the Forest Sector Project" substantial accomplishments were made in both the active tasks being pursued by the Project: National Sector Models and International Forest Product Trade Model. (Two earlier tasks initially in the Project have been completed or dropped: Processing Information and Control, and Environmental Effects of Forestry).

Kallio discussed the new phases the Project was entering-- extensive analysis of trade data, development of an operational international trade model (hopefully by January, 1984), and testing of the models. Kallio pointed out that the requirements and use of the models for analysis of short term trade flow projections and of long-term development scenarios presented different prob-

lems. A number of necessary background studies have been made or appear in plans: international economics and trade, wood products demand, technological development, analysis of trade data, and on issues concerning forestry, energy, and national institutions. Recent Project publications are listed in Appendix C.

The status of each Task at the time of last year's network meeting, and the accomplishments during the year are summarized in Table 1, according to an expanded list of subtasks in the development of operational and accepted models.

Publication in book form of the proceedings of the IIASA-cosponsored North American Conference on Forest Sector Models was mentioned. Among future meetings will be the Second North American Conference on Forest Sector Models to be held in Alexandria, Virginia (nearby Washington, DC, USA) November 9-10.

2.2. Project administration

In his status report, Kallio also summarized the changes in staff at the Project at IIASA. The staff now consists of Project Director Kallio, Deputy Director Ake Andersson, Dennis Dykstra, Gabor Kornai, Valeri Fedrov (part time), Miyoko Yamada, and Lucy Tomsits.

At various times during the meeting, both participants and Project staff discussed the need for better communication between and among collaborators. The national teams desire more up-to-date status of research, explanation of changes in research dir-

Table 1.--Forest Sector Project Progress

<u>Stage:</u>	<u>Mill info & control systems</u>	<u>National sector models</u> <u>1/</u>	<u>Global trade models</u>	<u>Environ- mental effects</u>
Survey existing concepts & models	XX -----	XX	XX	----- ?
Develop models con- cepts, data needs		XY	XY	
Collect, check, ad- just data		PY	(PY)	
Analyze functional relationships		PY	(PY)	
Develop software applications		XY	(PY)	
Pilot test on lim- ited data		PY -----	PY	
Test on baseline scenario		(C)	(F)	
Test on alternative policy scenarios		(C)	(F)	
Adopt as functional tool, maintain data		C	C	

Symbols:

- XX = Previously completed research
 XY = Research completed past year
 PY = Pilot or partially-completed research
 F = Future research at IIASA
 C = Future research by collaborators
 () = Research emphasis in coming year
 ----- = IIASA research role complete or dropped
1/ = All stages of national models are complete by some
 collaborating country teams.
 2/ = Included as part of the background studies in the Research
 Plan.

action, and now that operational models are becoming available, advice, tips, and updates on model implementation. Several participants also mentioned that it would be useful (and necessary to good research) to describe future research in greater detail in the planning documents.

Some participants also expressed apprehension that the resources available to IIASA in personnel and computer access are not sufficient to complete the models and use them for examining policy scenarios within the remaining project duration. They mentioned the enormous effort required to develop functional relationships and test alternative detailed components of a model as large as the proposed global trade model. Kallio commented that some of the past problems have been relieved and he now anticipated rapid progress.

2.3. Regional Subproject Arrangements

During the Network Meeting discussions occurred concerning two groups of collaborating teams with special concerns and desires:

The Western European collaborators and Hungary agreed to form a subgroup to develop a Western-Eastern European trade model that would help them incorporate international trade within their national models, and in turn assist in providing regional trade information to a global model. Participants from Austria, Federal Republic of Germany, Finland, the Netherlands, Italy, Sweden, the United Kingdom, and Hungary joined the talks. Other countries will be

invited to participate. They are considering employing the Buongiorno-Gilles model structure. The group is being coordinated by Peter Gluck of Austria.

Several years ago the United States and Canada agreed in principle to coordinate resource analysis and development of forest sector and trade models covering North America. The establishment of a Canadian modeling team will allow the coordination to go forward. Regional studies have been planned for Latin America and for South East Asia as well.

3. National Sector Model progress

3.1. Research completed at IIASA

During the last year IIASA has substantially completed the development work on prototype national models, and on concepts for detailed national models that could be developed for individual countries or groups of countries. Wolf-Dieter Grossman summarized the work of Lars Lonnstedt and his own in a paper "IIASA/FSP Forest Sector Prototype Models." A computer version of the prototype model has been completed and sent to a number of collaborating countries. Two papers by Lars Lonnstedt were available for distribution that describe the model in detail.

In the reports of national collaborating teams, representatives of several countries reported on progress on developing models for their countries. More details were discussed in a number of separate presentations. These country efforts can be

grouped into three general stages of development:

3.2. Countries with models independent of the prototype:

* Finland, as reported by Risto Seppala, has developed three models--a simulation model of the whole forest sector, a dynamic LP model to link with the IIASA project, and a forest component model by type and species. These models are being used extensively in an assessment called Forest 2000. Finland's once active reference group is now only informal.

* Sweden, reported by Ake Andersson, has several operating national models on which development is continuing. (Details of these models have been reported in previous IIASA meetings.) Recent work has developed links between the forest biology, forest product processing, technology adoption, investment, national economy, and trade components. The models have been used to set policy for the national building materials research program.

* Australia, reported by David Batten in context of another presentation, is continuing development of a spatial equilibrium model as part of its national modeling effort.

* New Zealand has several regional and national models, as reported by Bruce Manley. Though his country has just begun organizing to collaborate with the IIASA project, it is interested in developing links to world trade models, since 75 percent of its timber supply is likely to be exported by year 2000.

* Italy's continuing development of its national forest sector model was described by Massimo Florio and Giacomo Politi in "Econometric Model of the Italian Furniture Industry." The model is intended primarily for short-term forecasting. Though it emphasizes the furniture industry, a principal Italian wood user and export, the model is being extended to include the forestry raw material base. Italy has a national reference group and support from its National Council on Research.

* Hungary's national model development was described by Tibor Bencze in "Outline of the Hungarian Forest Sector Models" and by Csaba Forgacs and Zsolt Harnos in "A Forest Management Model." Hungary has begun using its models on IIASA's computer but has not yet applied them to policy issues. It has a national reference group.

* The United States has continued development of several national models covering the solid softwood, the solid hardwood, and pulp and paper sectors. The report by Richard Haynes and William Lange, "Development and Use of National Models in the United States", described how application of the models for resource assessment and policy purposes has resulted in continuing improvement and expansion of the models' capabilities. The United States has an active but informal coordinating group. Both the USDA Forest Service and U.S. industry are financing the development of a U.S. component model for the world trade model, and

perhaps augmenting world trade model research.

3.3. Countries implementing the IIASA prototype model

* Austria, according to Peter Schwarzbauer's report and his paper "Austrian Forest Sector Model", is attempting to use the prototype model at IIASA facilities. The work has just begun, and the need for a trade linkage is apparent. Austria's advisory group has been more interested in trade data and situations than in models.

* The Federal Republic of Germany, has obtained the prototype program and is trying to implement it, as reported by Heiner Ollmann. A primary interest of the FRG is in environmental and policy implications, particularly the acid rain problem thought to be causing extensive mortality and growth loss in central Europe. FRG is awaiting developments before forming an active reference group. Ollmann discussed the frustrations felt by the FRG group.

* The Netherlands has started to implement the prototype program, as reported by Abbo de Wit. But the Dutch realize that modifications will be necessary to adapt it to a country where a low proportion (8 percent) of national wood needs are furnished by its own forests and where wood is the second largest import. De Wit described work on technical and policy studies on wood demand and environmental and non-timber uses.

3.4. Countries starting modeling or active collaboration

* Canada, as reported by Douglas Williams, has begun a major effort to model its forest sector using a spatial equilibrium approaches based on the U.S. and Scandinavian model approaches. This research, being conducted by Peter Pearse, Sten Nilsson, and himself, is centered at the University of British Columbia but funded by the Canadian federal government. Canada's coordinating group, composed of federal and industry representatives, is supporting the country-wide effort.

* The United Kingdom is organizing forest sector modeling efforts, as reported by Allister Moon in "Prospects for a UK Forest Sector Model." Though the UK imports 90 percent of its wood requirements, its importing and processing firms have shown little interest in the project. More interest has been shown by university cooperators in modeling forest management decision-making and domestic timber supply. Ironically, the Forestry Commission desires more emphasis on industrial processing and import studies.

* The Soviet Union has not had an active program, but intends to continue participation, reported by Valeri Fedrov. The Soviets would like the models to reflect differences between market and planned economies, and they confront great problems in translating USSR data to IIASA specifications. (Kallio responded that the problems of planned economies, data transformation, and intra-country divisions can be handled by the models being con-

sidered.)

A presentation by Gennady Shaitanov discussed the "Development of the USSR Forest Products Industry and Soviet Exports of Forest Products" and a paper by Vladimir Chenkov reported on the "Dynamics of Forest Stand Structure and its Impact on Global Timber Trade Modeling." Many questions on Soviet forest conditions, processing expansion, and export capabilities were asked.

Markku Kallio reported briefly on progress of countries not represented at the network meeting. Work in Japan is progressing on their econometric models, and Norway is cooperating with other Nordic modeling efforts. Discussions have been held with Brazil about modeling their forest sector, and with Chile for modeling the remainder of Latin America. Australia is offering to model SE Asian and Oceanic countries. The Economic Commission for Africa has undertaken to study forest sectors in Africa, with a conference scheduled. France has not been active recently.

Discussion and comments from a number of countries expressed anxieties that work on national models, particularly advice and assistance in applying the computer version of the prototype model, would cease with the departure of the developers from the IIASA staff. They hoped that the concentration of the work at IIASA on the international trade model would not preclude offering assistance in national modeling efforts.

4. Global Trade Model Development

The principal task the Forest Sector Project is now the development of one or more global trade models. Research, primarily at IIASA, continued in five stages of model development-- concepts and data requirements, collection and adjustment of data, functional relationships, software development, and one pilot test on limited data (see Table 1).

4.1. Model development and testing

Joe Buongiorno described the work that he and Keith Gilles accomplished with the assistance of other researchers at IIASA early this summer in "A Model of International Trade of Forest Products." They adapted a portion of the framework and software used in the North American pulp and paper model to a global trade model. A pilot test of the model on one product (newsprint) and on seven areas (exporters: Canada, Nordic countries, rest of world; importers: USA, Japan, W. Europe, rest of world).

In the Buongiorno-Gilles model, each importer or exporter is represented by an excess demand or excess supply function dependent on price, and each year the model finds an equilibrium price structure that maximizes incremental consumer and producer surpluses less transportation cost. Each subsequent year the excess demand and supply functions are adjusted by shifters based on previous price or quantity or exogenous variables. The test results, despite the simplification, showed approximate conformance with actual trends. A paper distributed presents addition-

al detail.

Seppo Salo and Markku Kallio described the concepts of "A Global Trade Model" and Matti Kirjasniemi and Esko Uutela discussed "Some Data considerations for a Global Trade Model." The Kirjasniemi-Salo-Uutela-Kallio model concept is an elaboration of the Buongiorno-Gilles model in that each component has a combined domestic-export demand function. Each component's supply function is implicitly represented by a input/output matrix structure converting raw materials (large and small coniferous wood, large and small nonconiferous wood, recycled paper) to processed and unprocessed products for consumption and export. The maximizing rule and solution technique in concept is similar to the Buongiorno-Gilles model. (The Kirjasniemi-Salo-Uutela-Kallio model closely resembles the more complete pulp and paper model discussed by Buongiorno at last year's network meeting).

The Kirjasniemi-Salo-Uutela-Kallio model requires substantial additional data, particularly for the supply structure. Kirjasniemi and Uutela discussed how approximate supply-cost functions for each paper product could be obtained from data in the Jaakko Poyry computerized data base containing specifications of all the world's pulp and paper mills. Cost functions and capacities would have to be obtained elsewhere for mechanically processed products and the wood and recycled raw materials.

A distributed paper describes in detail the Kirjasniemi-

Salo-Uutela-Kallio model. A test has not yet been developed, but the model could be solved on existing non-linear optimizing software.

A third, still more complex approach for a global trade model was presented by David Batten and Borje Johansson in "A Composite Approach for International Trade." This approach could accommodate a variety of demand and supply representations for each regional component and alternate maximizing functions. It would, however, handle a variety of trade linkage phenomena quite explicitly--trade barriers such as tariffs and quotas, bilateral agreements, historical trade preferences, and inertia in adjustments in trade patterns in response to demand, supply, and price changes. Several distributed papers give details of the approach.

Extended discussion accompanying these papers concentrated on the tradeoffs between simplicity and ease of implementation and the better representation of global production and trade phenomena. A consensus emerged that while the first IIASA model should be based on at least the Buongiorno-Gilles approach for all components, it should strive to incorporate the more detailed supply structures of the Kirjasniemi-Salo-Uutela-Kallio approach to the extent data permit.

4.2. Data assembling, adjustment, and analysis

Dennis Dykstra discussed "Data Considerations" for develop-

ment of global trade models. He covered perceived needs for final product demand functions, costs of wood raw materials, manufacturing, and final product delivery; conversion factors; recycled fiber recovery; and discount, deflators, and exchange rates. For many of these data needs, published sources from FAO, UN statistical office, or ECE or UNIDO are available. Data from such sources vary in comprehensiveness and quality, since efforts to monitor sources and check consistency differ. For other data items, especially those required for the more elaborate supply structures of the Kirjasniemi-Salo-Uutela-Kallio model, information must be specially obtained from national member teams. Details are given in a paper distributed by Dykstra.

The discussion following Dykstra's presentation centered on the need for the data from each country on costs, mill capacity, and resources; the feasibility of collecting and analyzing it in time to use in the model development; and problems of obtaining data from non-participating countries and regions. It was agreed that a request for the minimally necessary data to supplement standard sources should be prepared and sent out as soon as possible.

Andras Nagy, Ann Francescon, and Gabor Kornai of the IIASA staff described the collection, adjustment, and analysis of international trade statistics. They have developed a computer data base of trade statistics from 1962 to 1981 for an expanded list of 22 products and 53 countries and regions. Their "Historical

Analysis of International Trade in Forest Products" describes the changing volumes and country shares of international trade flows.

Additional publications by William McKillop and others describing the development of functional relationships, and the problems that econometric analysis may encounter, were available at the meeting, but were not discussed.

Discussion of data analysis problems brought out the frequent problems of reconciliation of information within and between sources. Many participants indicated that the sanitized data would be valuable to country teams and other users, and encouraged IIASA to release the data.

5. Related Forest Sector Research

Several presentations discussed aspects of forest sector and trade modeling that will be important in use of models to analyze issues and problems in scenario analysis.

Ake Andersson discussed the work with which he was involved in Sweden to determine the impacts of research and development on long-term development of new products and processes, and on the supply of wood raw materials. One factor he stressed was the differences in trade of commodity groups with homogenous characteristics, and of groups composed of differentiated, branded, or special products.

Three presentations of staff members of UNIDO discussed the

"World Wide Study of Wood and Wood Processing Industry by UNIDO." Caj Falcke described the project in general, S. Khan spoke about the "Policies and Strategies Related to the Development of Wood Processing Industries in Developing Countries", and Jack Weeks discussed the "Restructuring of the Wood Sector in Asia-Pacific Regions."

The UNIDO effort is developing substantial data that will be valuable in modeling forest sectors in the developing regions. Likewise the IIASA research on techniques for modeling national forest sectors and international trade should help agencies such as UNIDO improve their analyses of trends and alternative policies.

Roger Sedjo of RFF discussed his work to analyze trends and project developments in "Global Forest Resources." He emphasized the need to incorporate more detailed and realistic features in long-term models for forest resource trends and capabilities and on developing forest management technology.

6. Future Tasks and Deadlines

The Network Meeting ended with a discussion of tasks to be accomplished in the next year by IIASA Forest Sector Project staff and collaborators:

Task

Deadline

* Send out request detailing data to be

furnished by all collaborators. (Also collect information on regional data sources, to be published as auxilliary compendium.)

October 1983
(Deadline for receipt of data is July 1984)

* Initiate a "network newsletter", more frequent and less formal than Modules, to maximize information flow between IIASA and collaborators, and among collaborators.

Start immediately

* Coordinate a task force of Eastern and Western European countries to identify the steps necessary to build a model of the European Forest Sector.

Organizational meeting scheduled for November 22-23, 1983 at IIASA.

* Construct a preliminary or first version of the global trade models using the best presently available data and concepts that will allow completion within agreed-upon deadline. This model would be based upon the Kirjasniemi-Salo-Uutela-Kallio concepts where data are sufficient, but otherwise upon on the Buongiorno-Gilless model.

January 1984

* As data become available, analyze and consolidate these data, and incorporate into the global trade model. Keep collaborators informed as to current status of model and modeling needs.

July 1984

- * Assist collaborators in implementing the national models, particularly where an IIASA prototype model has been selected for implementation. Ongoing

- * Send out a questionnaire to identify policy scenarios to be analyzed by the global trade model. (Coordinate and link this request with data collection questionnaire). October 1983

- * As data availability changes, refine the selected policy scenarios so that they are consistent with data. June 1984

**International Institute for Applied Systems Analysis (IIASA)
FOREST SECTOR PROJECT
NETWORK MEETING**

**29 August — 2 September, 1983
Sopron, Hungary**

A G E N D A

MONDAY, 29 AUGUST

- 9:00 Opening:
Markku Kallio, Forest Sector Project, IIASA
Tibor Asbóth, The Hungarian Committee for Applied Systems Analysis
- 9:15 Status Report and Research Plan of the Forest Sector Project
Markku Kallio, Forest Sector Project, IIASA
- 10:00 Reports from National Collaborating Teams
Peter Schwarzbauer (Austria)
Douglas Williams (Canada)
Heiner Ollmann (FRG)
- 10:30 Coffee Break
- 11:00 Reports from National Collaborating Teams (continued)
Risto Seppälä (Finland)
Tibor Bencze (Hungary)
Massimo Florio (Italy)
Abbo de Wit (The Netherlands)
Bruce Manley (New Zealand)
Allister Moon (UK)
- 12:00 Lunch
- 14:00 Reports from National Collaborating Teams (continued)
William Lange (USA)
Valeri Fedorov (USSR)
Markku Kallio (other regions)
Clark Row (past and future meetings in the USA)
- 15:15 Detailed Reports from National Collaborating Teams
Richard Haynes (USA)
Recent Evolution of US Forest Sector Models and their Implementations
- 15:30 *Allister Moon* (UK)
Prospects for a UK Forest Sector Model
- 16:00 Coffee Break
- 16:30 *Massimo Florio* and *Mino Politi* (Italy)
Econometric Model of the Italian Furniture Industry
- 17:00 *Gennady Shaitanov* (USSR)
The State and Prospects of Development of the USSR Forest Products Industry; Soviet Exports of Forest Products
- 17:30 *Vladimir Chuenkov* (USSR)
Dynamics of Forest Stands Structure and Its Impact on Global Timber Trade Modeling

TUESDAY, 30 AUGUST

- 9:00 *Joseph Buongiorno* (USA)
A Model of International Trade of Forest Products
- 9:40 *Seppo Salo* (Finland)
A Global Trade Model of Forest Products
- 10:30 Coffee Break
- 10:50 *Dennis Dykstra* (IIASA)
Data Considerations (Discussion)
- 12:20 Lunch
- 13:40 *Wolf-Dieter Grossmann* (IIASA)
IIASA/FSP Forest Sector Prototype Model
- 14:15 *Dennis Dykstra* (IIASA)
Data Considerations (Discussion continued)
- 16:00 Visit to University of Forestry and Wood Industry, Sopron

WEDNESDAY, 31 AUGUST

- 9:00 *Philip Wardle* (FAO, Italy)
On FAO Data
- 9:15 *András Nagy, Ann Francescon, and Gabór Kornai* (IIASA)
An Historical Analysis of International Trade in Forest Products
- 10:55 Coffee Break
- 11:10 *David F. Batten* (Australia) and *Börje Johansson* (IIASA)
A Composite Approach for International Trade
- 11:55 *Matti Kirjasniemi* and *Esko Uutela* (Finland)
Some Data Considerations for a Global Trade Model
- 12:20 *Risto Seppälä* (Finland)
Status of Forest Sector Modeling in Finland
- 12:40 Lunch
- 14:00 *Sikander Khan* (UNIDO)
Policies and Strategies Related to the Development of Wood Processing Industries in Developing Countries
- 14:40 *Tibor Bencze* (Hungary)
Outline of the Hungarian Forest Sector Models
- 15:15 *Csaba Fogacs* (Hungary)
A Forest Management Model
- 15:45 Coffee Break
- 16:10 *Åke Andersson* (IIASA)
R & D in the Forest Sector
- 17:00 *Peter Schwarzbauer* (Austria)
Austrian Forest Sector Model
- 17:30 *Jack Weeks* (UNIDO)
Restructuring of the Wood Sector in Asia-Pacific Region

THURSDAY, 1 SEPTEMBER 1983

9:00 - 18:00

Excursion to Szombathely. Szombathely is a town nearby Sopron. We will visit a modern wood processing factory as well as the forest in the nearby area.

FRIDAY, 2 SEPTEMBER

- 9:00 *Caj Falcke* (UNIDO)
The World Wide Study of Wood and Wood Processing Industry by UNIDO.
- 9:45 *Roger Sedjo* (USA)
Global Forest Resources
- 10:20 Coffee Break
- 11:00 *Clark Row* (USA)
Summary Report
- 11:40 *Dennis Dykstra* (IIASA)
Final Discussion
- 12:00 Lunch

APPENDIX B

International Institute for Applied Systems Analysis (IIASA)

**FOREST SECTOR PROJECT
NETWORK MEETING**

29 August — 2 September, 1983

Sopron, Hungary

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APPENDIX C: List of publications of the Forest Sector Project

Kallio, M., A. Propoi, and R. Seppälä (1980) *A Model for the Forest Sector*. WP-80-34. Laxenburg, Austria.

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