

THE DIALOGUE APPROACH ON THE FOREST SECTOR  
WITH A HUNGARIAN EXAMPLE

by

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**1. BACKGROUND**

The forests all over the world are subject to heavy external impact. A historical example is the extinction of forests in the Middle East about Christ, or the near extinction of forests in the middle-age in Western Europe. Now, in the tropics, rainforests are destroyed in a brisk pace due to conflicts in land use, need for resources, and desire for economical development. A positive turn was the afforestation started in Austria and Germany at about 1800.

Problems of the forest sector cannot be seen in isolation. Problems are created first by interactions inside the sector and second, between the sector and its environment. Actions taken for solving a problem affects the whole sector as well as other sectors. This can offset counter actions. For a list of other problems and ways of how to address them see Grossmann and Lönnstedt 1982.

Growth and yield are the basis for the existence of any forest sector. In Table 1 some of these interactions are listed.

Other interactions exist with:

**Table 1** Some variables or whole sectors interacting with growth and yield.

Name	Subject to:	Effect upon:
Ecological stability	management, soil, pollution, etc.	reliability of the supply with forest resource
Conflicts in land use	food availability, growth of settlements	forest area, erosion
Accessibility of the forest resource	roads, capital investment, environmental regulations	groundwater, tourism, slash and burn farmers
Thinning	management	growth, harvest, ecological stability
Fertilizer	management	growth, environment

- (i) • technology  
• depletion of resources

which together affect the substitution of forest resources by other resources and vice versa, thus affecting demand and yield,

- (ii) • environmental concern  
• recreational demands  
• attitudes and fashions

which may affect the choice of the species, the area available for harvests, etc.,

- (iii) • balance of payments  
• exchange rates

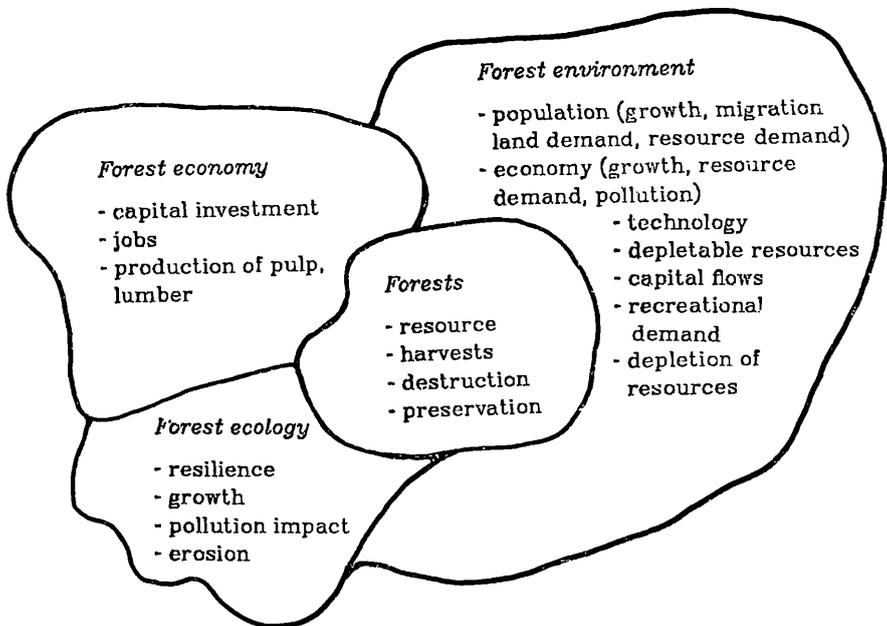
which may affect the pressure to harvest domestic resources for export or substitution of exports

Such a list cannot be complete, but for a given country and a given problem, usually a reasonable short list can be put together. All items in

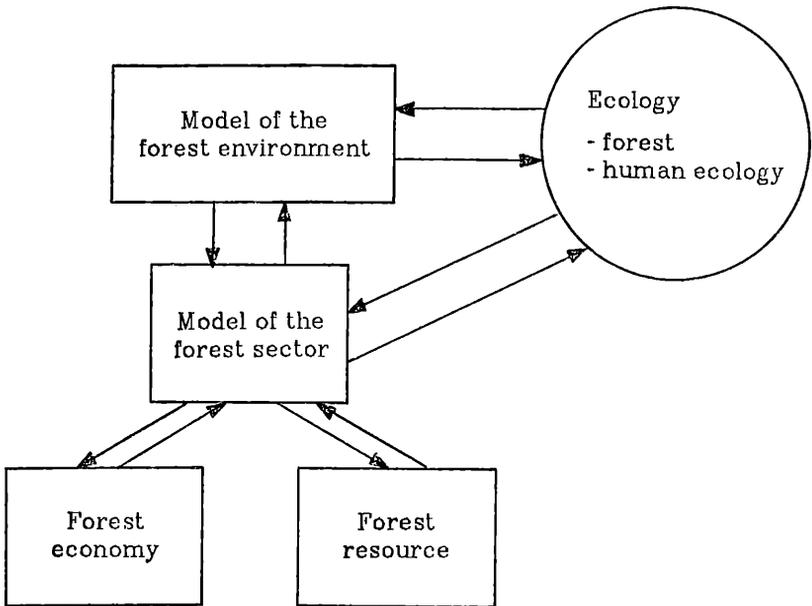
such a list are interacting with growth and yield; a holistic view of these interactions can help to solve many problems.

Hence the approach in the IIASA Forest Sector Project (Adams et al. 1982) is concentrated on the interlinkages and on the feedback structure. All areas which are depicted in Figure 1 and most items of Table 1 are included in the approach. But as a comprehensive coverage of these wide areas is not possible — even most large models have failed (Lee 1973; Holling 1978) — all areas are only covered in a parsimonious and aggregated way.

In the IIASA project, the forest sectors are analyzed on a national or regional basis (subtask A) and on a global level (subtask B). In subtask A, a model structure has been developed (see Figure 2), which directly corresponds to Figure 1.



*Figure 1.* The forests and their environment are connected to many areas like population, land use, capital investment and flows. These relations may vary from country to country, forest to forest and they may vary in time.



*Figure 2.* Structure of national and regional models. The sectors of Figure 1 are depicted in different models. Hence development, testing, application and changing of the models are simpler.

## 2. DIALOGUES – THE APPROACH IN APPLICATION

The approach consists of a dialogue between the national research teams consisting of scientists and decision makers, and the IIASA team. Subjects of this dialogue are

- (i) the problem or problem area, towards which the work should be concentrated
- (ii) expectations about the future development of the system, which according to the problem has to be analyzed. This defines which data are needed. If these data are not available, sensitivity analysis and scenario approaches are used to find out the importance of these data.

(iii) results which are wanted as an outcome of the work.

The points (i) to (iii) determine the work. Usually a national model is constructed, starting from a prototype model built at IIASA. This prototype model consists of modules, each of which describes in a simple way the most typical features of one area like pollution: generation by industry and population, absorption by forests, partial destruction of forests and other biosystems by pollution, resulting decrease of capability of the forests to absorb pollution, etc. Other modules deal with industry, its profitability, competitiveness, growth, economic cycles, resource and other constraints.

The first dialogue is conducted in workshops about the problem. The next dialogues are more technical: the IIASA prototype model is used to find out the relevance of the available model structures for the problem at hand, to access data, and to make sensitivity tests. In the final dialogues, a detailed national model is used for analysis of the problem. The results of this analysis are then reproduced with a much smaller model, which in an obvious and simple way can produce the observed patterns causing the problem and which can help to test management options to mitigate or even solve these problems.

As the whole work is done in close cooperation with decision makers, the results should be useful and applicable. It is the responsibility of the decision makers to ensure, from the beginning, the relevance of the addressed problems and it is the group of these persons who determine the form of the results.

The dialogue with the decision makers cannot be based on detailed models. Decision makers do not have time to use complicated models and even the most complex model cannot include all the important issues. Therefore, in the end, a very simple and reasonable structure must be prepared which generates the observed behavior, is fully acceptable, can easily be explained, and can help to address the prespecified problem.

The decision makers can now ask "what-if-questions." It is our experience that answers are only acceptable if they first improve understanding, and second, the answers must be generated in a very clear and understandable way.

### **3. EXAMPLE —APPLICATION TO HUNGARY**

At a workshop the Hungarian collaborators of the IIASA project stated the following important problem related to their forest sector: Hungary cannot produce enough high quality softwood. The reasons are that the soil is not favorable for growth of softwood and there are large fluctuations in water availability. Hence much softwood has to be imported. This creates problems in the balance of payment. Costs for imports of softwood are second to costs for energy imports.

Hence Hungary wants to replace as much softwood as possible by hardwood and other substitutes. The researchers and decision makers participating in the workshop concluded that this will cause two subproblems. First, hardwood pulp (pulp is one of the main products made out of the imported softwood) is of low quality and it is expensive. There is, however, new technological know-how becoming available about cheaper and high quality ways of producing hardwood pulp, mainly from South East Asia. Introduction of this technology will cause investment costs and cost for purchasing technology. But the available capital is limited. This limitation on capital affects as well other possibilities to substitute softwood (sleepers are now made out of concrete, steel rods can replace timber, etc.).

The second subproblem that turned out in the workshop was: the amount of available hardwood is restricted due to ecological reasons. Any increase in cuttings affects ever more ecologically sensible areas. Moreover, recreation, tourism and other societal services are endangered, like preservation and purification of ground water, etc. But Hungary even wants to expand these societal services. Second, each increase in industrial activities — either due to creation of new industrial complexes to replace softwood with whatever substitute or due to increased economical

activities to pay for the ever more expensive softwood does not only demand capital investment, which then lacks in other sectors, but it means as well an increase in pollution. Many Hungarian forests are already heavily affected by pollution (acid rain, heavy metals). Increase in pollution causes decrease of increment in hardwood and deterioration of the environmental services offered by the forests.

The workshop concluded that there exists a vicious circle in the system of the Hungarian forests and their environment: increase of economic activities to replace softwood causes decrease of growth in hardwood. As the sustainable yield of hardwood drops, the efforts for substitution have to be increased ever more. The impact of these activities on the hardwood forests will become ever more detrimental finally endangering many forests.

The outcome of the work for the Hungarian forest sector will be one or a few small models, which show the advantages and trade-offs for these different options. Based on these models and elaborated in simpler structures, conclusions and suggestions will be made for implementations of alternative approaches to mitigate the problem caused by the lack of softwood. But this is only possible within an embracing, although parsimonious description of the forests and their environment which is provided by the model structure of Figure 2; and it is only feasible and acceptable for the decision makers due to the method of dialogues.

## REFERENCES

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Artikel/Article: [The dialouge approach on the forest sector with a Hungarian example 8-15](#)