Legislative Commission on Minnesota Resources

Broad-based Study on Forestry in Minnesota

Proposed Terms of Reference

KO PÖYRY
Helsinki London Paris Sao Paulo Stockholm Zug (Zürich)
Buenos Aires Dar es Salaam Madrid Munich Portland Tehran Vancouver

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1 INTRODUCTION

The forests, also in Minnesota, are generally used for the following main purposes: conservation of a unique ecosystem, timber production, wildlife management, recreation and pasturing.

In 1970 forest land covered 19 million acres or 37 percent of the total land area of the state of Minnesota. Timber production and processing usually give the most important and tangible contribution from the forests to the material welfare of a community. In Minnesota, forest industries are one of the biggest sectors of manufacturing industry. Total employment in forestry and wood-based industries is around 56 000 of which 10 000 are in logging. The annual gross sales value of forest products, including remanufacturing in the state, is estimated at more than one billion dollars.

The general conditions for forestry and forest industries are favorable in Minnesota. The climate and soil are good for tree growing, the terrain is easy, the winter is helpful for logging, great consumption centres and regions with little own forests are not far away, and recruitment of a capable work force for forestry has been no problem.

There are, however, indications that the progress in forestry and forest industries in Minnesota has been slow despite the favorable conditions. Only a fraction of the economic potential of the Minnesotan forests is being realized. Also the non-timber uses of forests could be substantially increased.

Being aware of the unutilized potential in forestry, the Legislative Commission on Minnesota Resources contracted Jaakko Pöyry Consulting Oy to make a preliminary appraisal of the situation as an independent consultant, and in particular, to prepare a proposal for the terms of reference for a Broad-based Study which the Commission has had in mind for some time.

In February, 1978 Jaakko Pöyry Consulting Oy submitted a report, "Forestry in Minnesota - a Preliminary Appraisal". In the following a proposal for the terms of reference for the Broad-based Study is presented. A tentative study program is also described.

2 BASIC PROBLEMS TODAY

The basic problems of the Minnesotan forestry and timber economy are:

- The quality of the growing stock decreases continuously, even though the volume increases.
- There is a marked discrepancy between the raw material now required by the consumers and the raw material provided by the forests.
- The forest resource as a whole is unevenly exploited and much under-utilized. Softwoods are overexploited while low grade hardwoods remain largely unused.
- The rate of mortality is alarming.
- There is considerable pressure towards the non-timber use of forests. Problems and conflicts occur which may hamper the progress of material forestry.

A dominating feature is thus the increasing availability of lower value hardwoods. This trend is likely to continue because changes in the wood-growing apparatus are time-consuming in the conditions of Minnesota. For this reason, wood consumption should rather be adapted to the raw material supply.

To achieve a long-term improvement in the composition of the forests the existing growing stock must be used much more intensively. From the viewpoint of forest management this means that the excess wood must be removed from the forests.

The volume of annually harvested timber could thus be considerably increased and the forest industries could be correspondingly expanded, provided that the particular kind of raw material which is abundantly available, could be utilized. The direct and indirect benefits of such a development would be obvious. At present, Minnesota is a net importer of wood-based products some of which could be manufactured within the state.

Against this background major adjustments and changes will be necessary and to this end large investments in forests, industrial plants and various associated fields will be needed. Intensive research and thorough planning are needed to guide the future development.

If these problems are to be attacked and if long-term solutions and improvements are sought, policy decisions and appropriate action should be taken immediately.

Because of the biological imperatives, changes in the composition of the growing stock can only be attained by active silviculture and in the course of time.

The time aspect is illustrated in the following comparison:

Time Span	Action and Attainable Changes
Less than 10 years	Initial silvicultural inputs. Extensive planting of non-productive land. Improvement of the existing growing stock mainly through resolute removal of low-grade stock.
10 - 30 years	Continued silvicultural inputs. Period of transition. The composition and volume of the growing stock and timber harvest improve.
More than 30 years	Stabilized silvicultural inputs. Results maturing. The growing stock and timber harvest approaching the desired composition and volume.

The shorter the time span the more the action is tied to the present forest resource and to the restructuring of its utilization. Even though the long-term goals are mostly beyond the time horizon of the people now involved, they must be defined because of the long life span of trees.

The long-term goals can be reached only through short and medium-term action. These goals largely determine what should be done today and in the near future.

The essential measures are:

- To create full utilization of the large volumes of timber available from the present stands.
- To define the long-term goals and forest investment programs for short and medium-term action.
- To define a policy aimed at optimum exploitation of the potential for growing and utilizing timber.
- To observe, in all planning and action, the need for conservation of the environmental qualities of forests and their recreational and wildlife benefits.

It is obvious that any study aimed at improving the performance of the Minnesotan forestry and timber economy should be planned and conducted as an entity encompassing forestry, forest industries and non-timber uses of forests.

The problems described in this chapter are the objects and challenges of the Broad-based Study, wich is outlined in Chapters 3, 4 and 5.

3
OBJECTIVES OF THE BROAD-BASED STUDY

The main objective of the study is to provide a sound basis for the formulation of State policies, goals and priorities in the forestry sector, comprising land use, forest management, timber growing, harvesting, utilization, processing and marketing.

The study will define the role, goals and objectives of Minnesota's forests as seen in a state and nationwide context:

- as an irreplaceable material base for producing timber for industry and other uses, and for creating manifold direct and indirect benefits, particularly in rural districts

- as a versatile source of amenities and other non-timber uses, including conservation of a rich forest environment, supply of clean water, and other benefits

The study will identify and evaluate alternative goals and programs. It will outline the short and medium-term measures and investments which are needed to attain long-term goals, in forestry as well as in industries. The study will also analyze the means available to implement the recommended policies and it will identify the constraints to be overcome. It will concentrate on problem areas most of which have already been briefly discussed in the Preliminary Appraisal Report.

The study will answer the following main questions:

1 What is the present situation in the material sector of forestry and timber utilization?

2 What is the present situation in the non-timber sector of forest use?

3 To what extent should the timber growing potential be utilized?

4 What is the available timber supply in the future and how would it develop as a result of alternative improvement programs?

5 What short-term adjustments and/or basic changes are necessary and/or desirable in timber consumption?

6 What is the comparative national competitiveness of Minnesotan forest industries and what are the implications of this competitiveness for the timber growing policies?

7 What are the investment opportunities in forest industries and how should the industries be developed to achieve better utilization of all the timber at hand in the forests?

8 What is the present situation in the sector of labor and logging and what steps will be needed to secure capable manpower and equipment for forest operations?

9 What will be the demand for and benefits of non-timber uses of forests? How will they influence timber growing?

10 What alternative timber growing programs are desirable and realistic in Minnesota?

11 What are the investment and other input requirements of alternative timber growing programs? What are the economics of these programs at the levels of forestry, forest industries and the state economy?

12 Which incentives would be needed to make the forest owners more willing to invest in forest management?

13 What measures would be feasible for promoting progress in private forestry?

14 What will be the role of publicly-owned forests?

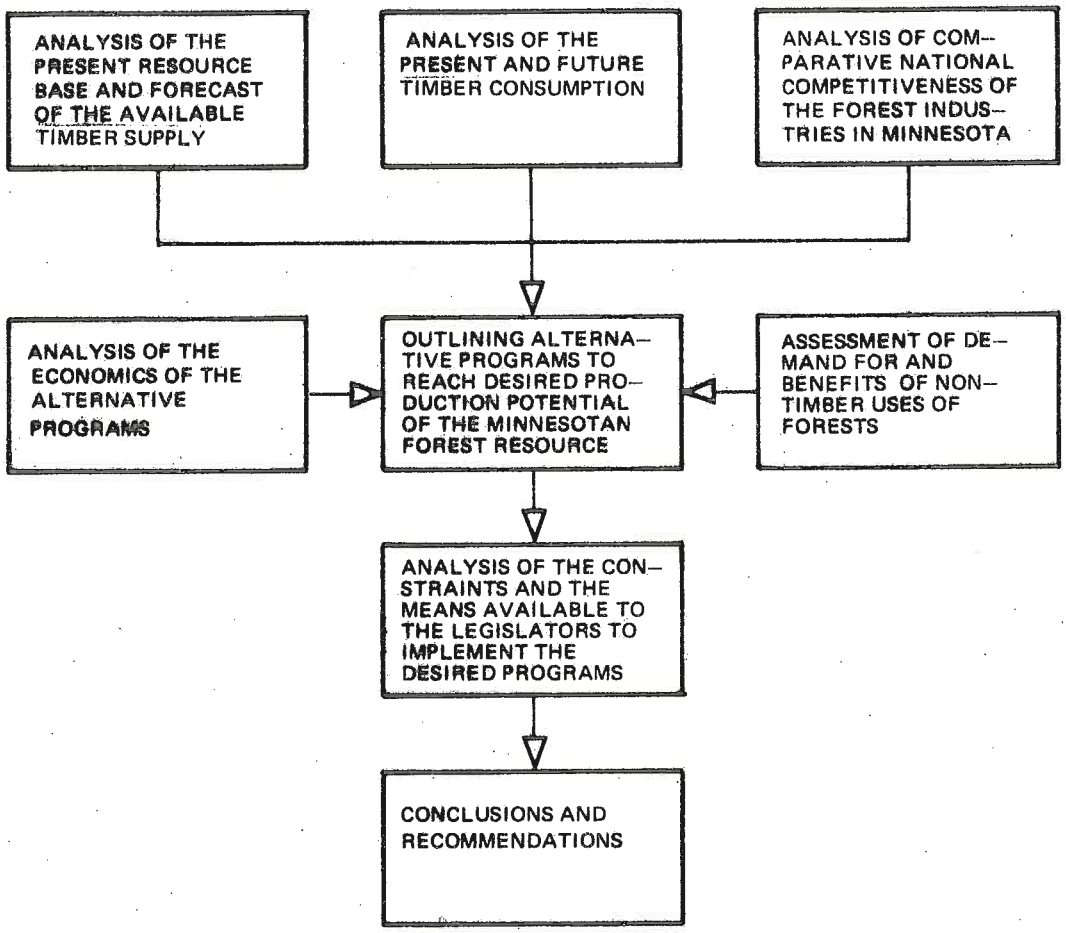
15 What are the main obstacles to more intensive forestry?

16 Will there be a need for reappraisal of the research programs?

The structure of the Broad-based Study is presented in Figure 1.

Figure 1

STRUCTURE OF THE BROAD–BASED STUDY



4
SCOPE OF THE BROAD-BASED STUDY

4.1
General

This chapter outlines the studies and analyses needed to meet the objectives of the study and to answer the main questions posed. The headings of this chapter also reflect the structure of the Final Study Report supplemented with such chapters as Executive Summary, Conclusions and Recommendations.

The depth of various analyses is not defined exactly. It is assumed that this can be done after the scope and approach have been mutually agreed upon.

4.2
Forest Resource and Timber Supply

Forest resource data and timber supply are analyzed on the basis of the latest forest survey and the results of the earlier surveys. The time horizons of the timber supply forecasts are 10, 30 and 50 years. The main results are given by type of raw material, forest ownership and region.

Based on the latest inventory the following resource data are compiled and analyzed:

- commercial timber land
  -- by site productivity classes
  -- by principal regions
  -- by principal categories of ownership

- productive forest land withdrawn from timber production by ownership categories

- volume of growing stock for each ownership category
  -- by tree species and DBH classes
  -- by stand-size classes
  -- by age classes
  -- volume of saw timber by diameter and log grade classes, and pulpwood volume

- volume of cull and dead trees with usable stem timber

- net annual growth and annual mortality
  -- by tree species
  -- by stand-size classes
  -- by ownership categories

- net annual increment of growing stock and volume of timber stock by ownership categories

Necessary basic background material for the estimation of the effects of various forest management alternatives is collected and analyzed.

An analysis is made to recommend statistical systems which would define the components of the Minnesota forest balance in comparable units of measure. The components would be:

- growing stock
- gross and net increment of growing stock
- volumes of timber products harvested, logging losses, silvicultural removals and losses, and natural losses (mortality) as drain from the growing stock.

The study reviews present organization, working methods and techniques for:

- silviculture, including nurseries
- precommercial thinnings and timber stand improvement
- harvesting, particularly in commercial thinnings

4.3
Timber Consumption

Consumption of timber by the forest industries and in other uses is analysed on the basis of the available statistics. The analysis is directed at identifying the need for and possibilities of changing the consumption pattern of timber to suit the forecast supply from the forests.

The analysis will reveal the expansion possibilities of forest industries by major sectors.

The study also attempts to identify usages that offer opportunities to increase demand for timber in general, and low-quality hardwoods in particular. The potential importance of these usages is also assessed.

The possibilities of using low-quality hardwoods and residues as a source of energy is also reviewed.

Methods and techniques to increase precommercial thinnings and harvesting of low-quality hardwoods are analyzed and their economics are assessed.

4.4
Competitiveness of Forest Industries

The comparative national competitiveness of the Minnesotan forest industries is analysed and its future development is assessed. The impact of wood costs on the competitiveness is analysed and the economic value of wood raw material in alternative uses is estimated.

The prime purpose of this analysis is to find a sound economic basis for the guidelines of timber growing programs, particularly as regards the selection of tree species.

The analysis of the comparative competitiveness is based on case studies of mill models, which are briefly described indicating the process, major inputs and outputs, capital investment and production costs broken down into major components. The mill models are selected to be representative of the actual major competition.

The comparison of competitiveness is based on the calculated gross rate of return on the total invested capital and other relevant criteria.

The following products are included and the respective regions analyzed in the comparison with Minnesota:

Product	Region
lumber	other Mid-West West Coast South Canada
fiberboard	other Mid-West South West Coast Canada
particleboard	other Mid-West South West Coast Canada
plywood	West Coast
long-fibered and short-fibered market pulp	South West Coast Canada
newsprint	South Canada
wood-containing printings	other Mid-West East
wood-free fine paper	other Mid-West East
folding boxboard	other Mid-West
corrugating medium	other Mid-West
linerboard and sack kraft	South West Coast

4.5 Non-timber Uses of Forest Lands

Non-timber uses of the forest lands are identified. The present and future need for such uses, and their role in the society are assessed on the basis of existing information. Their impact on timber growing is assessed.

Land use policies are analyzed and their effect on the availability of commercial timber land is estimated. Especially the transfer of forest land into crop land and pasture, and the need for wildlife and recreational forest reserves are reviewed.

Particular emphasis is given to problem areas where timber and conservation/amenity interests seem to be in conflict. Solutions based on the multiple-use concept are sought.

4.6 Formulation of Timber Growing Programs

Based on the findings of and data produced by the preceding analyses, 2...3 alternative timber growing programs are formulated. These programs are described in aggregate terms. They do not go into sufficient detail to allow direct implementation. For this, detailed operational plans are needed.

The following four principles will guide the formulation of the alternative timber growing programs:

- Low-quality timber should be removed to improve the quality of the growing stock.
- The production potential of the forests should be exploited more intensively.
- Timber production should be harmonized with the consumption patterns of the forest industries.
- Timber production should be harmonized with the future non-timber uses of forests.

The main components of the timber growing programs are:

- long-term goals (up to 50 years) in terms of volume and type of timber to be produced
- silvicultural inputs and other forest management operations to meet the alternative goals
- impact of timber availability on forest industries and other users with special reference to the assessment of capacity expansion
- capital requirements and financing of timber growing programs
- economic and other benefits of the programs

4.7
Economics of Timber Growing Programs

The costs and benefits of the alternative timber growing programs are analyzed on the basis of the information to be collected during the field work of the study.

The economic returns of the alternative programs are analyzed at the levels of forestry (stumpage), forest industries (gross sales value) and state economy (contribution to GDP, employment effects, etc.).

A particular site and stand classification system is needed to ensure sound implementation of the plans. The classification system would ensure that the funds available are used in the right order of economic priority. The study recommends guidelines for such a system.

4.8
Constraints of Timber Growing Programs

Major constraints that possibly affect the implementation of timber growing programs are identified and analyzed. The following factors are reviewed among others:

- forestry organizations and their co-ordination
- availability of finance and attractiveness of forest investments
- land-ownership stabilization (e.g. county forests)
- promotion of private forestry
- education, training, extension services
- reconciling of non-timber uses with timber growing
- intensified land exchange program to facilitate effective forest management

4.9
Forest Policy and Legislation

The present forest policy and legislation are reviewed against the possible changes required by the timber growing programs. The present incentives aiming at intensified forest management and the need for changes are examined. The Study also outlines the possible implications for legislation that the future needs for non-timber uses of forests may have.

The changes may relate to:

- taxation
- forest practices and management
- financing of silvicultural inputs
- environmental protection and amenity interests
- legal status of county forests

5
TIMING OF THE BROAD-BASED STUDY

The tentative study program is presented in Figure 2. It is estimated that the study would take 10 to 14 months from the start to the submission of the final report. The study time required depends largely on the scope, approach and depth of analyses which are to be mutually agreed upon. No dates for the program can be fixed at this stage as it is dependent on the completion of the forest inventory now in its final stage.

It is envisaged that a fairly heavy field work program would be the first phase of the study (months 1...2). In the second phase (months 3...5) data would be analyzed. Alternative programs would be formulated and evaluated preliminarily. The results would be compiled into an Interim Report which would be reviewed at a Policy Meeting. The Meeting would select 1 or 2 alternatives and agree on guidelines for their further development and analysis.

In the third phase (months 6...7) some additional field work may prove necessary. The selected alternative(s) would be further developed and analyzed in the fourth phase (months 8...9). Also a draft Final Report would be compiled.

In the final phase (month 10) a Policy Meeting would review and comment on the draft Final Report, which would then be finalized and submitted to the Commission.

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Figure 2.