



MELA in use

Regional and national timber production analysis. The third analysis round covering whole Finland will be carried out in 1994-96 based on the data of the 8th national forest inventory in 1986-1994.

Updating of the forest resource data.

The forest management planning module of stand information systems in state, private and industrial forestry.

International applications since 1994. Lithuania, Estonia.

Besides analyses and planning results, MELA also serves as a platform for exporting research results to practical forestry, for incorporating new aspects in analyses, and for further development efforts.

With modifications, MELA is applicable for international forestry analyses, if compatible local forest data and models are available.

References

Regional and national analyses: National Forest Inventory, Forest 2000 Programme in 1985 and 1990

Stand information systems: The Finnish Forest and Park Service, Forestry Centre Tapio, forest industry companies, the Finnish Forest Research Institute (METLA)

For further information

Markku Siitonen
METLA
Helsinki Research Centre
Unioninkatu 40 A
FIN-00170 Helsinki, Finland
Tel. +358-0-8570 5332
Fax +358-0-625 308
E-mail markku.siitonen@metla.fi



E-mail mela@metla.fi

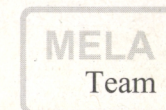
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MELA

System

Integrated
stand and forest level
analysis
for
forest management
and policy decisions



What is the MELA?

MELA is a forestry model and an operational decision support system for solving such problems as

- what are the production potentials of forests, and
- how to manage forest stands in order to achieve the overall goals for forestry.

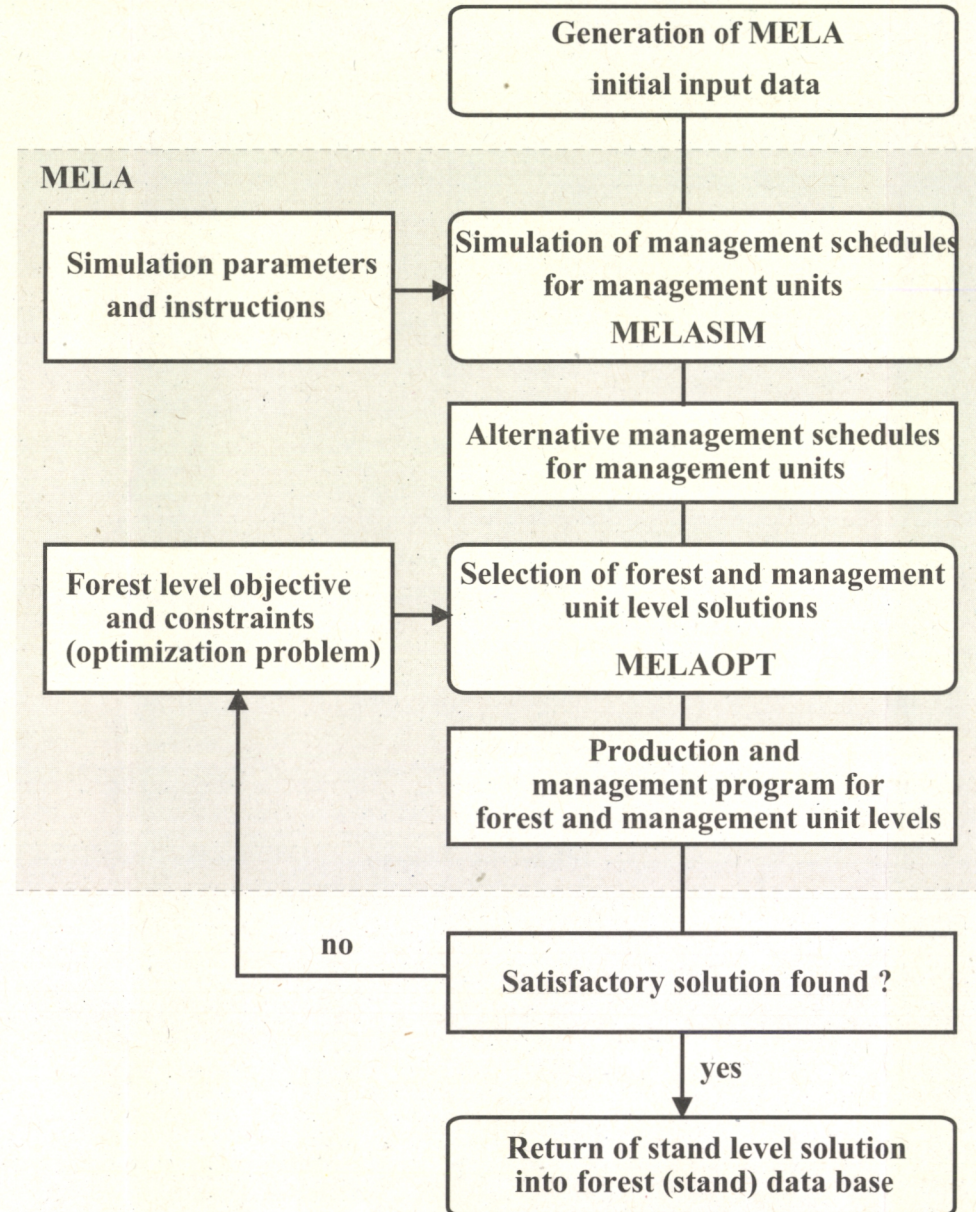
MELA was designed in the 1970s for regional and national timber production analyses in Finland. Currently, it is being used widely also in stand level forest management planning.

The MELA system consists of the MELASIM and MELAOPT programs, both wrapped into an interface module.

The individual tree-based stand simulator, MELASIM, automatically generates a number of feasible - sound and acceptable - management schedules for stands over time.

The JLP optimization software in MELAOPT simultaneously selects both a production program for the whole forestry unit and the management of stands based on user-supplied goals. There are hundreds of variables available as optional decision criteria combining the state of the forests, physical production and economy. Constraints can be supplied forest-wide for any group of management units.

A MELA task consists of several iterative steps.



Synthesis

MELA integrates forest level production planning and stand management optimization into a hierarchical multiple objective optimization problem. Forest management regimes are derived from the goals for forestry in each particular decision situation on a basis of actual forest resources and their predicted management and development potentials.

Variations

As well strategic forest policy and forest production planning questions at regional and national level as stand management problems at forest holding level can be solved as variations of this basic process.

The modifications may be manifested, for example,

- in the scope of the problem,
- in the variables of the actual utility function,
- in the planning horizon and resulting calculation periods in different situations, and
- in the size and complexity of the hierarchical structure of forestry units.