

Research on forest biomass utilization in Greece

par Elias VOULGARIDIS*

Greek forests cover 18,6 % (2,500 million hectares) of the total area of the country producing about 800 000 m³ round and industrial wood and 2 000 000 m³ fuelwood. The main species producing wood for technical use are pine (especially, black pine), fir, beech, poplar and - to a small extent oak and chestnut. Most of the fuelwood is produced by oak species. Other main forest products are oleoresin and briarwood.

Deficits of wood are large in Greece, and the balance is made with imports in round timber, sawnwood, pulp and paper, etc. that correspond to about 1 800 000 m³ round timber.

Harvesting operations are not extensively mechanized. Wood industries existing in Greece include : sawmills, flooring (parquet), veneer and plywood, particleboard and fiberboard, wood pulp, boxes and crates, match, preservation, oleoresin distillation and a great number of small wood-using units. Exports are limited in small quantities of certain products (oleoresin, plywood, particleboard, etc.).

The utilization of wood of small dimensions is the main problem of forest biomass utilization in Greece. Such material constitutes the majority of production from the forests due to the forest situation in the country.

Research on forest products and, generally, on forestry aspects is carried out in the :

a - Department of forestry and natural environment (D.F.N.E.), Aristotelian university, Thessaloniki (see Diagramm 1)

b - Forest research institute, Thessaloniki (F.R.I.T.).

c - Forest research institute, Athens

(F.R.I.A.) (see Diagramm 2).

d - Technological educational institutions (T.E.I.), Departments of forestry (D.F.) in Drama, Karditsa and Karpenissi (see Diagramm 3).

Professional foresters are educated

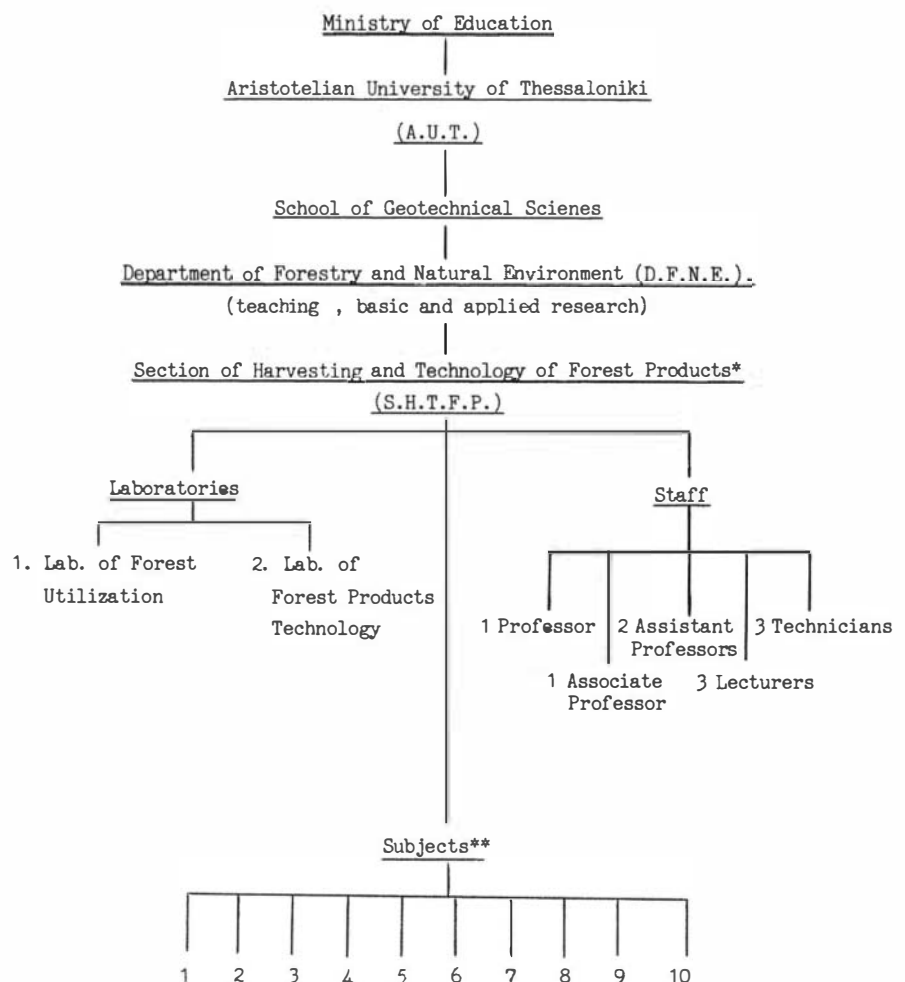


Diagramm 1

* - Other sections are : Forest production - Forest protection - Natural environment, Range and wildlife management, Planning and development of natural resources, Forestry techniques and torrent control works.

** - As described in the text.

* Associate professor, Aristotelian university, Department of forestry and natural environment, Thessaloniki, Greece
Director of Forest utilization laboratory,
Director of Section of harvesting and technology of forest products
54006 Thessaloniki, Greece

in D.F.N.E. where the two laboratories of i) Forest utilization and ii) Forest products technology from the sixteen existed, consist the Section of timber harvesting and technology of forest products that has the responsibility of education and research on forest products. Seven professors and lecturers is the staff of this section. The principal courses included in the 5-year curriculum that are relevant to Forest products are : Timber harvesting, Structure and properties of wood, Wood technology, Chemical wood technology, Wood preservation, Wood identification, Mechanical processing, Wood-based sheet materials, Forest industries, etc.

In F.R.I.T. three researchers (with Ph. D.) and in F.R.I.A. four researchers (two with Ph. D.) work on the area of forest products research. There is only one teacher (permanent staff) qualified in Wood science and technology (Ph. D.) in T.E.I.

A few forestry graduates qualified (MS., PH. D.) in Forest products or not work on private level or in private Forest industries.

The forest products research in the country is centralized during the last five years on the following topics :

- Utilization potentials of the wood of Mediterranean shrubs and coppice forests. It refers to evergreen hardwoods, oak and chestnut forests and includes a number of projects on structure and properties, briarwood, sawing and drying, production of particleboards, etc.
- Utilization of oleoresin and gum rosin from *Pinus halepensis* Mill. as basic constituents in water repellent formulations for solid wood and as hydrophobic additive in particleboards.
- Bark extractives from *Pinus halepensis* Mill. as bonding agents for plywood and particleboards.
- Preservation of wood for evaluation the treatability of Greek wood species with emphasis to refractory species.
- Experiments on solar drying of sawn softwood species.
- Utilization of forest biomass for producing energy.
- Sawing of beech logs to compare lumber yield between the "Live" and

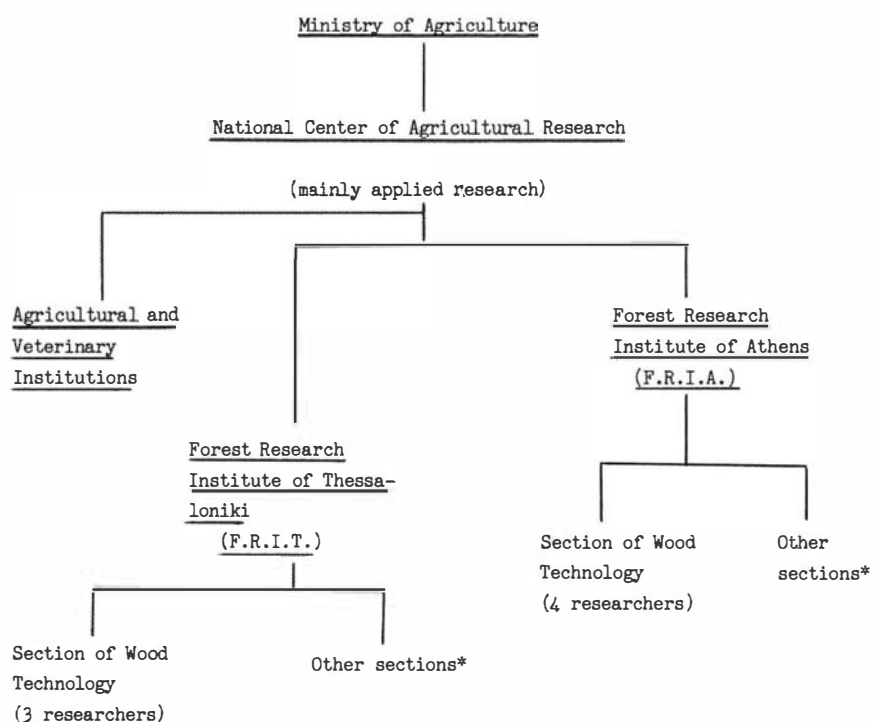


Diagramm 2

* - Silviculture, Forest pathology and protection, Forest soil science, Forest nurseries and genetics, etc...

"Around" sawing methods.

- Research on production of oleoresin from *Pinus halepensis* and *Pinus brutia* (productivity, factors and mechanism of resin flow, comparison between tapping methods, paraquat treatment, etc.).
- Properties, insect attack and utilization of pine wood (Aleppo pine, Hard pine) from burnt forests.
- Suitability of Aleppo pine wood for particleboard production.
- Utilization of olive residues, shells from almonds and branchwood from fruit tree plantations for particleboard production.
- Investigations on formaldehyde release from wood-based panels.
- Storage conditions of round wood in timber yards of wood industries and wood quality.
- Performance of surface coatings applied to wood in various climatic conditions.

There is an independence in forest products research strategy and policy for the Department of forestry and natural environment, the Departments

of forestry and, to a lesser extent, for the Forest research institutes, particularly in cases where the research projects are self-financed. However, there is a number of partners or organisations (private or state), especially in the last 10 years, involved in both forest products research policy and finance, as follows :

- a - Ministry of industry, Energy and technology.
- b - Ministry of agriculture.
- c - Ministry of education.
- d - E.E.C. sponsored research projects.
- e - Wood industry.

The Greek wood industry plays now an increasingly significant role in forest products research, whilst in the past its participation in such activities was rare.

f - Research committee of the Aristoteleian university of Thessaloniki (or other Greek university).

This Committee is the administrator of the various research projects carried out by University staff members but also is a sponsor of some new projects.

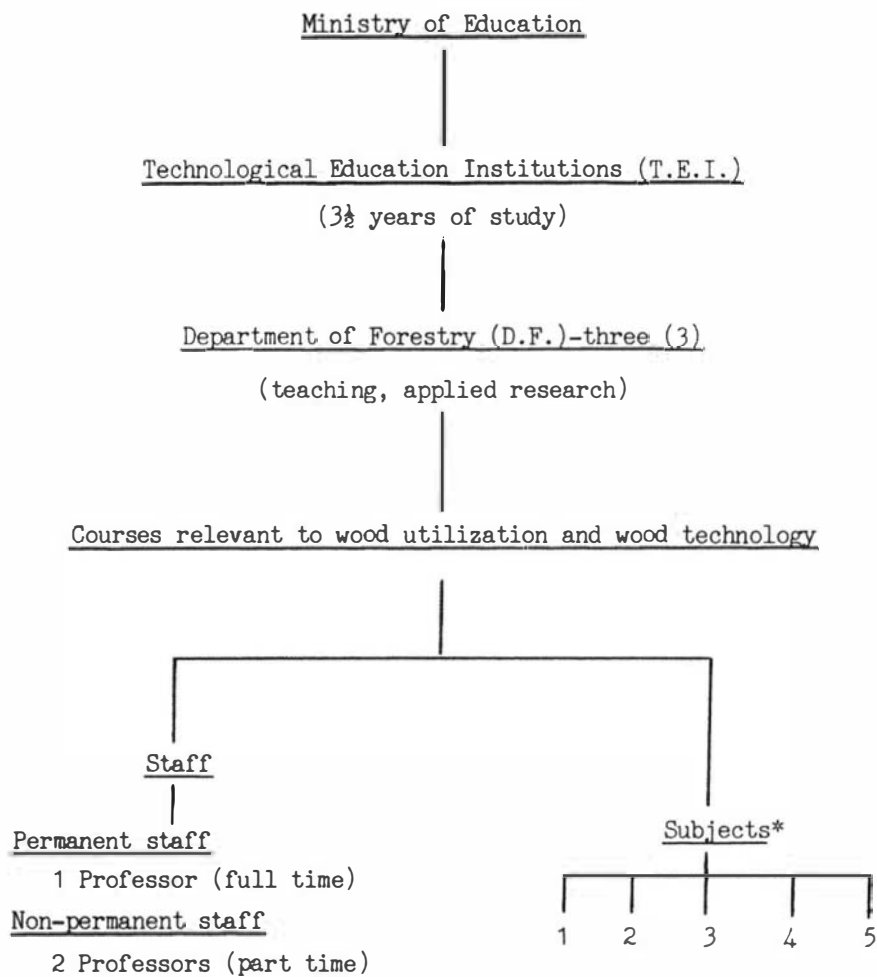


Diagramm 3

* - 1 and 2 : Compulsory subjects (Forest utilization, Wood technology)
3, 4 and 5 : Elective subjects (Wooden structures, Wood products - standardization, Furniture technology).

g - Other organizations (municipalities, cooperative associations, local administrations, etc.).

Submitted forest products research projects have to meet the general requirements (targets and aims) as described by the organizations sponsoring the specific research. Applied research on forest products has been promoted and strengthened during the last years after the active involvement of the above mentioned bodies and organizations.

During the last 2-3 years, the proposal of two studies that have been completed, is the establishment a) of an "Institute of wood" and b) of a "Furniture school". Both are lacking in Greece.

It can be concluded that significant steps have been made in forest products research in Greece, especially in the last 10 years. Prospects seem to be good and the results in the near future are expected to be interesting.

E.V.