

THE FINNISH FOREST AS A NATURAL RESOURCE

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In examining the problem of the Finnish forests, this article tries to show the interaction of legislation with the ecological and the economical aspects of the human use of the forest for Finland's development. *

The importance of the forest in Finland's industrial take-off¹

Finland's case history represents many analogies with the current problems of development.

Finland was a typical developing country until around the 1860's to the 1870's, when her industrial take-off took place. 80% of the population worked in agriculture and the country was a net importer of cereals. Her semi-colonial status was probably one of the main reasons for this delay in development.

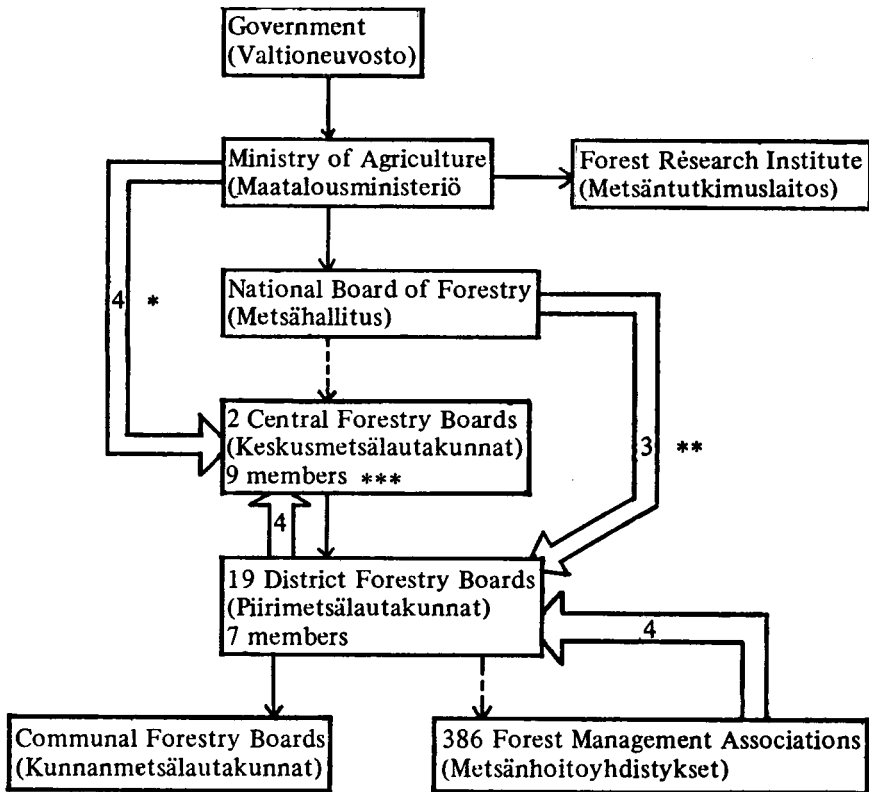
Her take-off was preceded by large reforms which took Finland from the era of restrictive mercantilism into the era of liberalism. Although today the historical conditions are different for the developing countries, it is obvious that their process of modernization has to be accompanied by administrative and legal reforms to purge them of those vestiges of traditionalism and colonialism that hinder their development.

As the case still is today, Finland's solution to development was to export in order to accumulate the capital necessary for her industrialization. Woodland being her only significant natural resource, Finland became a typical mono-exporting country, which made her vulnerable to the world price fluctuations. Historically, she was fortunate because the period of her take-off was characterized by favorable terms of trade, most world prices going down and the prices of wood products remaining stable.

It was also important to have a resource which would offer a possibility for increasingly diversified and refined products as the know-how and

* Development is understood here as a component of an optimum human environment which implies an adequate level of material development and quality of life.

¹ Jutikkala, E. Suomen teollistuminen (The industrialization of Finland), in Suomen talous—ja sosiaalhistorian kehityslinjoja, WSOY, Helsinki, 1968, pp. 206-220.



Note:

- ⇒ appoints members
- normal subordinate relationship
- .-.-> inspection and supervision

* 2 members represent the wood processing industry and 2 others, the workers' organizations

** of these members, one represents the wood processing industry and another one, the workers' organizations

*** the ninth member is the Director of the Board

the investment capacity increased. Since forest lands area renewable natural resource, this has also offered more security than a fast disappearing non-renewable resource would have done.

The administration of wood lands in Finland

The following organization flow chart represents the administration of the Finnish forests.

The administration can be studied on three levels:

1) The forest administration on government level

The Ministry of Agriculture is, according to the Law on Forest Administration (Laki Metsähallinnosta 9/9/1966/465), responsible for the overall forest administration. For this purpose, there is a Forest Bureau (Metsätoimisto) within the Ministry, which carries out the administrative work. According to the government-issued decree on the Ministry of Agriculture (Asetus Maatalousministeriöstä 2/5/1969/278), the Bureau has to supervise the overall administrative organization of the Finnish forests. In scope this covers such widespread concerns as forestry training, scientific research, commercial exploitation of the forests, and the protection of nature. Since practical administration is done mainly by the subordinated organizations, the task of the Bureau is principally limited to policy formulation.

There is also a Forestry Committee (Metsätalouden Neuvottelukunta) within the Ministry, which studies the fundamental problems of the forest economy. Several interest groups are represented on it, namely the National Board of Forestry, the Central Forestry Boards, the Central Association of Agricultural Producers (Maataloustuottajien Keskusliitto), the Federation of the Finnish Agricultural Workers (Suomen Maaseututyöväen Liitto), forest industry, and forest owners.

Due to the lack of personnel in the Forest Bureau and in the National Board of Forestry, the preparative legislative work is done mainly by *ad hoc* committees set up by the Government or the Ministry of Agriculture. This has made it possible to have experts and different interest groups participating in the formulation of statute laws.

Past experience has shown that concern for agriculture has left forestry in a relatively neglected position within the Ministry. Proposals have

been made to establish a Ministry of Forestry, but these have failed so far.²

2) The forest administration on national level

This is carried out by the National Board of Forestry, the Central Forestry Board Tapio (for Finnish-speaking districts) and the Central Forestry Board Skogskultur (for the Swedish-speaking districts).

According to the 1966 Law on Forest Administration, the National Board of Forestry has to manage state-owned forests** and generally promote the efficient exploitation of the economic forests, whether public or private.

According to the Law on Forestry Boards (Laki Metsälautakunnista 15/9/1967/411), the Central Forestry Boards control and aid the activity of the District Forestry Boards, control the uniform application of the Private Forestry Law and generally promote private forestry.

This dual organization is justifiable when it is considered that the National Board of Forestry is essentially a state organization, whereas the Central Forestry Boards' role is to represent a meeting ground for public and private interests. But in practice, a considerable amount of work related to the promotion and control of private forestry is duplicated. It would be more efficient to have a single administration at this level.³

3) The forest administration on local level

The District Forestry Boards do the actual field work. According to the Law on Forestry Boards they control the application of the Private Forestry Law and generally promote private forestry in their district, especially with practical help given to the landowners.

The Communal Forestry Boards, established in each commune, have only a limited supporting role.

The Forest Management Associations are forest owner organizations. Their functions have been established by the Law on the Forestry Management Associations (Laki Metsänhoitoyhdistyksistä 17/11/1950/

²Holopainen, V., *Vastuun Metsäpolitiikka* (For a responsible forestry policy), Kirjayhtymä, Tampere, 1970, p. 132.

**In fact 98% of the state-owned forests. The economic forests are managed for commercial benefit, but taking into account public interest. Of the protected forests, some are managed by the Forests Research Institute, the rest being under the responsibility of the National Board of Forestry.

³Holopainen, *op. cit. supra*, pp. 133-134.

558). Their aim is to promote professional knowledge and skill among the forest owners. They also give professional assistance in silvicultural work and other forestry activities. They have a considerable autonomy as they are administered by the owners themselves and are self-financing. Each forest owner whose forest annually produces not less than twenty cubic meters of timber, has to pay the Forest Management Association of his district "forestry dues", which are from 2 to 6% of the net yield assessed for communal taxation.

Beyond the criticism mentioned, this system is quite adequate as a theoretical model. It fulfils the three basic needs of the Finnish private forestry which is divided into numerous small holdings:

(a) Public aid from above in the form of:

— a guarantee and a protection of the local organizations by statute laws;

— the financial, material and educational aid of the state organizations.

(b) A sufficient decentralization in the form of:

— independence of the local organizations through self-financing and autonomous administration (the Forest Management Associations), and through the possibility to nominate part of the members of the hierarchically superior organizations;

— control from above which does not restrict the owner excessively, but which prevents an anarchic use of the forest.

(c) An adequate consultation and representation of all major interest groups through their representatives in the Central Forestry Boards and the District Forestry Boards.

It is interesting to note, also, the role of this administrative systems in promoting ecologically — orientated forest management in the economic forests, which has been completely ignored by the statute laws. Especially the National Board of Forestry and the Central Forestry Boards make a considerable effort to implement a policy of economic exploitation which would conserve exceptional natural and scenic features and ecosystems whenever possible.

The legislative principles

The following principles have emerged as the guiding lights of a legislation which has to combine the requirements of ecology, of industrial development, and of the general welfare of the people

1) The principle of durability. This principle, although subject to various interpretations as to its details, means roughly that the forest area and the growing stock *** should not decrease. Genetic and ecological variety should also be conserved.

In an economic context, it becomes the sustained yield principle, according to which the forest has to be optimally exploited so that the future timber supply is guaranteed without lowering the current yield.

The principle of durability, motivated by the fear of a disappearing forest, first appeared in the 1647 Swede-Finnish Forest Law (Ruotsi-Suomen Metsälaki). Since then, it has been a constant factor, having played an important role in the Forest Laws of 1664, 1734 and 1886.^{3a}

This preventive legislation, together with the relatively late industrialisation and the low density of population, has preserved the Finnish forests almost intact until recent times.

2) The principle of improvement. This principle is a logical continuation of the sustained yield principle. According to it, the growing stock should be improved qualitatively and quantitatively through such measures as forest drainage, building of infrastructure, fertilization, planting, and seeding.

3) The principle of multiple use. Ideally, this means that the same forest area should be used for as many purposes as possible, ranging from the commercial extraction of the wood to the provision of recreational outdoor areas for city dwellers and a habitat for wildlife. In practice, since some uses are incompatible, this has also led to the division of the forest into specific categories defined by statute law or administrative decisions.

The principle of multiple use is quite a new one as a theoretical concept, since until recently the Finnish forest could easily sustain all these activities without their becoming conflictual.

For practical purposes, Finnish forests are generally divided into two big categories: the protected forests and the economic forests.

*** This is the total cubic volume of the timber on stands.

^{3a} Finland was under Swedish rule until 1809. Until then, statute laws were common for both Sweden and Finland. From 1809 until 1917, when Finland gained her independence, she was a Grand Duchy attached to Russia but had an autonomous status and passed her own statute laws.

I. THE PROTECTED FORESTS

A. The Protective Forest Law (Suojametsälaki 11.8.1922/196)

Forests have a protective function which explains the purpose of this statute law.

The main cases where an area can be given the status of a protective forest are the following:

(a) To prevent the recession of the forest line (1 §). This has been applied to large forest areas in Northern Finland where the conditions of regeneration are very difficult.

(b) To conserve forest belts protecting settlements or cultivations against wind, when they are situated on very unprotected sea or inland water islands and beaches or on uplands and precipices (5 §).

(c) To prevent landslides and the advance of sand dunes (5 §).

This law is applicable both in state-owned forests and in private forests.

— Timber extraction in the protective forests

The law stipulates that “all other use of the forest, than what is required for the domestic needs of the farm, is allowed only according to the directions of the competent forestry authority” (2 §). This does not constitute a sufficient legal protection against abusive felling. In fact, some amount of felling has been permitted in the state-owned Northern Finland protective forests. This was done in the 1950's and the 1960's, as a measure to reduce the quantity of over-aged trees. It did not affect the forest line nor endanger the regeneration of the forest.

Recently, an expert has proposed⁴ that the northern protective forests could tolerate a significant commercial timber extraction. According to this estimate, Finland would lose 950 000 m³ of wood each year, should the extraction be forbidden. This would be 1.9% of the current total national extraction. This seems plausible in view of the past experience. But extreme caution should be taken in undertaken such an action, knowing the extreme difficulty of regeneration on the northern latitudes.

⁴ Kuusela, K., *Metsätalous teollistuvassa Suomessa (Forestry in Finland's process of industrialisation)*, SITRA sarja B No. 12, Helsinki, 1974, p. 114.

— The inadequacy of the protective forest law

All the possibilities of this law have not been used; most likely because of the slowness of the administrative procedure to establish protective forests. This is done by government issued decree, after the proposal of the National Board of Forestry (1 §, 5 §).

Moreover, the law ignores new aspects of environmental protection.

The Committee on Environmental Protection of the Year 1970 (Vuoden 1970 Ympäristösuojelutoimikunta), proposes a complete revision of the Protective Forest Law. The criteria to establish a protective forest should be extended to include a generally recognized need for environmental protection, including both ecological and scenic considerations. The control of the application of the law should belong to a central board having authority over environment related questions (ympäristösuojelun keskusviranomainen), which does not yet exist in Finland.⁵

B. The Law on the Protection of the Nature (Luonnonsuojelulaki 23.2.1923/71)

This statute law recognizes the fact that certain areas, having special natural significance, should be preserved from human impact.

A general protected area (yleinen suojelualue) can be established to preserve nature intact.

A special protected area (erityinen suojelualue) can be established to preserve an area regarded as having a great natural beauty or as containing significant natural features. It can also be done to protect an animal or plant species.

The decision to establish these protected areas have to be made by statute law or, if the area is 50 hectares^{5a} or smaller, by a government decree.

All this applies to state-owned land (1 §). A special protected area can also be established on private land, but it can only be done if the owner makes an application which has to be accepted through an administrative procedure (9 §).

However, the state has the possibility to expropriate real estate for the establishment of a protected area (18 §). But this has had little practical value so far, since state-owned land has been sufficient in supplying land for protection purposes.

The terms general and special protected area were not defined with precision by the Law on the Protection of Nature. However, with the

⁵ Komiteamietintö 1971: B 15, p. 122.

^{5a} 1 hectare is equivalent to 2.471 acres.

Law on the Establishment of Certain Nature Protection Areas on State-owned Land (Laki Eräiden Luonnonsuojelualueiden Perustamisesta Valtionmaille 18.2.1938/83) these terms came to mean respectively strict nature reserve (luonnonpuisto) and national park (kansallispuisto). This corresponds also to the internationally accepted terminology. This has remained constant practice in all subsequent legislation on the protected areas.

1) *The strict nature reserves* ⁶

The purpose of these areas is to provide intact nature reserves for scientific research. Consequently, no or very little tourism is allowed. The Law on the Protection of the Nature stipulates to what extent this type of area should be conserved. This covers the prohibition of agriculture, the extraction of wood, and in general the harming of animals and the collecting of any inanimate or living objects (2 §).

— The present system of strict nature reserves is not satisfactory

(a) The protection given by the Law on the Protection of Nature, can be purely theoretical since exceptions to the prohibitions concerning the use of the strict nature reserves can be made by a government-issued decree (4 §). The Decree on Certain Nature Protection Areas on the Stateowned Land (Asetus Eräistä Valtionmaiden Luonnonsuojelualueista 6.6.1958/273), shows that these exceptions can annul to a large extent the effect of the Law on the Protection of Nature. These include, for instance, the allowance of limited agriculture and the free killing of certain animal species (1 §).

(b) The application of the Law on the Protection of Nature is ambiguous. From the preparatory workings of the 1938 law and the wording of the 1958 decree, it clearly appears that the strict nature reserves are intended for scientific research. Some scientific experiments have a negative effect on the ecosystem, especially those which are done to study man's impact on the environment. But the areas which are presently protected as strict nature reserves, contain some unique existing examples

⁶In 1973, there were 15 strict nature reserves covering 85 925 hectares, i.e. 0.5% of the total forest area. N. B. All statistical information, unless another source is specified, are taken from the 1972 Yearbook of Forest Statistic Official statistics of Finland XVII A:5, Helsinki 1974.

of the Finnish nature. Since they cannot be sacrificed, better adapted areas for scientific research are required.^{6 a}

(c) The 1958 decree allows a considerable amount of impact in the strict nature reserves, such as limited agriculture, extraction of timber for construction on the site, indiscriminate killing of certain animal species, etc. Thus, scientific research lacks areas where the ecosystems would be totally intact.

(d) Presently, not all types of ecosystems are protected within this system, a fact which prevents certain research from being done in adequate conditions.⁷

2) *The national parks*

The degree of protection to be given to the national parks, as stated in the 1958 decree, corresponds to that given to the strict nature reserves. In practice, the real difference comes from the fact that national parks are destined for tourism.

Since they are visited by the public, the greatest danger for the ecology is the human impact. To prevent any damage, an effective management of the parks is needed. Unfortunately, this does not exist in Finland. Of the nine national parks, none fill the international norms set up by I. U. C. N.⁸ According to these, one qualified person should be employed for every 100 km², and a budget of Fmk 200^{8 a} should be provided for every 10 km². At present, there are five people employed as guards for all the parks. This means that over half of the parks are without a guard and that no personnel exists for the upkeep of the park and for the guidance of the visitors. The existing infrastructure is also minimal.⁹

— The economic use of the national parks

Another management-related problem is to what extent economic activity other than related to tourism,^{9 a} can be allowed in the national parks.

^{6 a} Suominen, T., Luonnonsuojelualueittemme alennustila (The degradation of our nature protection areas), Suomen Luonto, N:o 4/1974, pp. 114-115.

⁷ Hintikka, V., Biologinen tutkimustyö ja nykyiset luonnonsuojelualueet (Biological research and the present nature protection areas), Suomen Luonto, N:o 4/1974, pp. 124-129.

⁸ IUCN Publ. N. S. N:o 11, 1967.

^{8 a} One U.S. is approximately Fm 44.

⁹ Ormio, H., Missä viipyy kansallispuistojen hoito (When is the management for the national parks), Suomen Luonto, N:o 4/1974, pp. 121-123.

^{9 a} Tourism-related economic activity would imply in this context that all infrastructure which is not directly necessary for visiting the park (e.g. camping grounds, restaurant, etc.) should be situated outside the park if possible.

This is principally a problem of defining the concept of national park. According to the I. U. C. N. definition, all economic uses or improvements of nature are to be banned from any area designed as a national park. In spirit, the Finnish legislation follows this line. The little amount of economic activity that is legally allowed, is to preserve the traditional rights of the population (e.g. provision of pasture land for reindeers).

The problem of felling is more complicated. Recently, there have been proposals to cut down the over-aged tree population in the parks.¹⁰ There is a strong connotation that any such follings would provide raw material for they wood processing industry.

This would be against the principle adopted by the 1958 decree, according to which:

All activity, tending to change the specific scenic features of the area or to have an adverse effect on the survival of the original vegetation or animal life, is prohibited in the national parks (3 §)..

However, commercial felling could be disguised as a forestry management measure which is permitted by the same decree.

It is prohibited... to extract timber... unless... it is necessary... for protecting the area against forest fire, or otherwise necessary in view of the purpose of the area (3 §).

If sufficient pressure be put on the government, a new decree might be issued permitting this type of activity.

Normally the natural regeneration is preceded by forest fires or the natural decay of the tree. Some experts consider, therefore, that felling would be unnatural and would not fulfill the ecological function of the more natural processes.¹¹

Economically, it is not entirely justifiable either, since the economic forests still contain large areas of over-aged trees. This is especially true for the state-owned economic forests, for which it has been estimated that it will take forty years to cut down the over-aged trees.¹²

¹⁰ Kalliola, R., Vanhojen metsien asema ja merkitys: Kansal lispuistejen metsät (The position of the old forests and their significance: The forests of the national parks), Suomen Luonto, N:o 2/1973, pp. 76-77.

¹¹ *Ibid.*

¹² Karimaa, H., Vanhojen metsien asema ja merkitys: Valtionmaiden vanhat talousmetsät (The position of the old forests and their significance: The state-owned old forests), Suomen Luonto, N:o 2/1973, pp. 78-79.

C. Areas Protected on the State-owned Land by a Decision of the National Board of Forestry^{12 a}

When the National Board of Forestry feels that certain areas which are under its management should be preserved from excessive economic exploitation, it can take appropriate measures for their protection. In practice, this has resulted in two typer of special status.

*1) The virgin forests (Aarnialueet)*¹³

They represent particular areas of virgin nature. All forestry measures are forbidden in them, but exceptions are allowed. These areas are mostly reserved for an eventual incorporation into a national park or for scientific research.

2) The nature management forests (Luonnonhoitometsät)^{13 a}

These are economic forests, where specific objectives have been set for the protection of nature. Commercial felling is allowed when it does not conflict with the specific natural characteristics of the area. In practice, three separate levels of protection can be found within the same nature management forest.

(a) Virgin area where the ecological entity is conserved intact and no forestry measures are allowed.

(b) Park area where the stress is put on scenic protection but where felling is permitted.

(c) Economic forest area where normal commercial felling is permitted but where nature should be protected whenever possible.

All areas of the natural management forest may also serve as recreational area in the case of which appropriate infrastructure has to be implanted.

This policy of the National Board of Forestry to protect nature in the areas under its management is a welcome relief to the lack of protected areas. But this type of administrative status is vulnerable, especially since powerful pressure groups are opposing the extension of the protected

^{12 a} Metsähallituksen kiertokirje N:o 8/9/3/1970.

¹³ 79 511 hectares, which is 0.4% of the total forest area.

^{13 a} 140 398 hectares, which is 0.75% of the total forest area.

areas. It would make sense, therefore, to consolidate the status of these areas by a statute law.

D. The extension of the protected areas

The present national parks and strict nature reserves have been mainly established in the 1940's and the 1950's, when the aim was to conserve samples of the main forest types and especially to protect the specific natural aspects of Northern Finland on a scale which would have international significance. The general belief was then that large forest areas outside the protected areas would be preserved from economic exploitation. This reasoning is no longer valid. The commercial fellings have become more intensive and have reached the most unaccessible regions of Finland because of the growing need of raw material for the wood processing industry. Therefore, it has become important to define clearly those areas which should remain outside this type of economic exploitation.

The considerations motivating the extension of the protected areas are of social and of ecological nature.

1). The need for socially-orientated nature conservation areas

The human psychological need for recreational forest areas has become quantitatively more important in Finland, resulting from the increased tourism and the increasing availability of free time for the city dwellers.

The need of outdoor recreational areas outside urban settlements has traditionally been guaranteed in Finland by the custom of everymanright. This is the freedom for every citizen to move about on all forest land, irrespective of ownership. In some conditions it was understood to include free camping, the right to move about on cultivated land and on private waterways.

This custom was originated during the times when the forest was in large supply. Increased tourism, especially of foreign origin, and the increased use of the land for clearly defined purposes, has jeopardized the existence of the everymanright. A state committee was established in 1963 to propose a statute law on outdoor recreation.¹⁴ The committee concluded that the everymanright should be included in the new law with certain reserves. These are mainly to protect nature and to prevent any damage that might be detrimental to the interests of the landowner (e.g. the pro-

¹⁴ The Committee on the Outdoor Recreation Law (Ulkoilulakikomitea).

hibition to enter a forest area which has been planted or seeded recently). In 1969, the government made a proposal for a law on outdoor recreation (hallituksen esitys ulkoilulaiksi 209/1969).

But an adequate solution would have to include the selection of large areas reserved for outdoor recreation and simultaneously for the protection of nature. This need is felt especially near urban centers where large untouched forest areas are quickly disappearing. The above mentioned committee has already proposed the establishment of socially orientated nature protection areas.

The state Committee on Environmental Protection of the Year 1970, has also recognized the urgent need for increased outdoor recreational areas.^{14a} A country like Finland, with a large forest area could afford more of this type of land use than is the case presently. Finland devotes 0.8% of her land area to this purpose according to the estimation of the committee. This is 0.06 hectares for every inhabitant. It compares with 12.2% of the land area and 0.6 hectares for every inhabitant in the United States, and respectively 1.6% and 0.1 hectares in Sweden. The committee proposed 5-10% of the total land area to be used for this purpose. Of this 1/5, should constitute central zones where no commercial wood extraction should be allowed. This would eliminate only 1-2% of the total land area from commercial extraction of wood. According to the committee, it would not constitute a significant economic loss.

The acquisition of these areas would not be difficult, even within the framework of the present legislation. A large proportion, especially those situated far away from urban centers, would be taken from state-owned land. As for the acquisition of the private land, the Law on the Protection of Nature contains already a clause on expropriation (18 §). The problem would be more of an economic nature, high compensations having to be paid for the private lands situated near the southern urban centers.

The organization of these areas would be more complicated. Investment would be required to build the necessary infrastructure for outdoor recreation. Necessary measures should be also taken by statute law or by government decree to establish specific rules for the protection of nature in each area.

2) *The extension program of the national parks*

A program to extend the national parks was proposed in March 1973, by the Advisory Board for Environmental Conservation (Ympäristösuojelun Neuvottelukunta). This is the first systematic and global plan made

^{14a} *Op. cit.*, *supra*, pp. 90-98.

in Finland. It offers a definite network of areas that should be preserved from man's economical impact.

The planning of the program had been guided by the following principles which are based on nationally accepted criteria and international recommendations:

(a) The national parks should represent complete scenic entities typical to each region.

(b) Samples of all important ecosystems should be represented.

(c) Wherever possible, natural curiosities should be included.

(d) Ecosystems should be conserved in their entirety, wherever possible.

(e) The national parks should be large enough to sustain a significant number of visitors.

At least part of the parks should provide habitat for wildlife.

(f) The heavily populated areas of Southern and Central Finland should contain a sufficient number of parks.

Two examples will show the urgency of this problem.

The first one concerns the peatlands. In order to increase her total forest area, Finland is practising an extensive forest drainage which destroys some 300 000 hectares of peatland every year. At this rate, this typically Finnish ecosystem will disappear within fifteen years. Presently, 70 692 hectares of peatland are protected against forest drainage by an administrative decision. But this is little compared with the area disappearing, and the administrative protection does not offer the same stability as a statuted law would.

The second example concerns wildlife. There is a pressing need to provide sufficiently large reserves for many species of wildlife which are disappearing from Finland. According to a 1968 survey, of the four biggest predators in Finland, there remain the following: 120 bears, 100 lynxes, 60 wolverines, and 25 wolves.

The immediate scapegoat is the privileges given to the reindeer breeders, which permits the killing of these predators (except the lynx), even in the strict nature reserves and the national parks. This could be partly solved by an adequate compensation scheme for the lost reindeers. But the lack of adequately protected areas would still constitute a major obstacle. Presently, only one national park (Lemmenjoki National Park — 1 720 km²) is large enough to provide a habitat for the wolf and the

wolverine.¹⁵ The projected Koilliskaira National Park (2 900 km²) with its virgin nature would offer such a refuge.

The new plan proposes the establishment of thirty-five new parks and the enlargement of nine existing ones. The national parkland area would be increased from the present 2 400 km² to 5 600 km². They would thus account for 1.8% of Finland's total land area. The Koilliskaira National Park would be by far the biggest one. The greatest number of the proposed parks would be situated in the heavily populated Southern and Central Finland.

Despite all the research and planning for determining new options for the conservation of Finland's nature, the practical results are disappointing. The efforts to pass statute laws on outdoor recreation and the establishment of the new national parks have failed until now.

Although the National Board of Forestry is making efforts to protect land areas which could become national parks, the future is uncertain. There is a growing opposition against the establishment of the national parks which seems to have its roots in the wood-processing industry.

According to one estimate, the potential loss of wood for the industry would be some 330 000 m³ annually, should the national park program be implemented.¹⁶

The presently accepted concept of human environment would partly tend to justify the economic argument. An adequate human environment implicitly includes an adequate level of development. The projected national parks are situated in some of the most underdeveloped regions of Finland where any loss of economic opportunity would be hardest felt.

But some economic arguments can be offered for the protection of nature.

The loss of 330 000 m³ from the projected national parks is little, compared with, for instance, the total drain (55 million m³ in 1971), the potential of commercial fellings in the protective forests (950 000 m³ annually), or the loss of timber in the process of felling and transport (approximately 5 million m³ every year). Most likely, improvements in transport would save already what is lost in the national parks.

A well-managed network of national parks would provide increased income from tourism and a higher level of employment.

The biggest problem in the contradiction between the economic use and the non-economic use of the forest, resides, most likely, in the general problem of method. Traditional economic analysis does not take into account environmental factors in its cost and benefit analysis. If the human psychological need of virgin nature would be quantified and then compared

¹⁵ Suominen, T., *op. cit.*, *supra*, p. 115.

¹⁶ Kuusela, K., *op. cit.*, *supra*, p. 114.

with the benefits given by commercial fellings, the current conflict might end up in a conciliation.

However, both sides in the argument agree that new legislation is needed to end the present state of uncertainty.

The problem of the protected forests has considered mainly the qualitative aspects of the forest as a natural resource. In the general problem of the economic forests, the qualitative problems will remain but the quantitative aspects, i.e., the survival of the forest in any form, will become more relevant.

II. THE ECONOMIC FORESTS

The economic forests can be divided into two big groups, according to their ownership category. Roughly 73.2% of the total forest area is in private hands and 24.7% is owned by the state.

A. The Private Forests

About 63% of the total forest area is owned by commercial companies, for the most part within the forest industry. Although they produce only about 10% of the wood used by the wood processing industries, their contribution is significant. Not only their yield is proportionally higher than in any other ownership group, but also the sustained yield principle is well observed. The forest improvements is perhaps the most intensive and rationalized within the private forestry.¹⁷

The rest of the private forests are distributed among several small owners. For 1969, we have the following figures:

<i>Area of the forest holding (hectares)</i>	<i>% of land in this category</i>
0 — 9.99	4.5
10 — 49.99	38.9
50 — 99.99	28.0
100 — 299.99	24.0
300 — 999.99	3.8
1 000 —	0.8

As we see, for instance in the biggest group, 38.9% of the land is divided into small forest holdings of 10 — 49.99 hectares each. Under

¹⁷ Linnanmies, O., Suomen metsä- ja puutalous (Finland's forest economy), Kirjayhtymä, Helsinki, 1970, pp. 133-138.

these conditions, a rational economic exploitation is difficult. Adequate controls are also needed to check that the sustained yield principle is observed.

The present legislation and the administrative organization reflect these particular conditions. The legal evolution has been characterized by the successive laws on private forests and by the concern of replacing the principle of sustained yield for the principle of improvement, through the numerous forest-improvement laws.

1) *The private forestry law* (Yksityismetsälaki 15/9/1967/412)

The Private Forestry Law of 1967, takes its original principles from the old Forest Law of 1886, which have been successively improved by the Decree to Prevent the Destruction of the Forest, of 1917 (Asetus Toimenpiteistä Metsän Hävittämisen Ehkäisemiseksi), and the Private Forestry Law of 1927. Together with the Law on the Forestry Boards of 1967, the Private Forestry Law aims to protect the forest against excessive fellings.

Although this law is a definite improvement, it does not quite fulfill the ideal requirements of the sustained yield principle.

The law starts off with the general principle, “forests should not be destroyed” (1 §).

But if the owner decides to convert his forest land for some other use, the felling that it involves is not regarded as a destruction of the forest. The law gives a list of examples of the type of conversion which is justified. This list is by no means exhaustive and, thus, can give room for interpretation. It includes such items as the conversion into arable land and the establishment of construction sites, road works, and storage areas (2 §).

The concept of destruction is identified with

Such felling and leaving the soil in such a state after the felling, or such use of the land that the natural renewal or the renewal by artificial regeneration is threatened, and also such treatment of a potentially developable forest, which would be in contradiction with its reasonable growth (1 §).

This clause is rather general and it can be argued that it does not cover the sustained yield principle, depending of how this concept is understood. Three interpretations can be found. Forest economy is sustained when:

(a) In the process of felling, the necessity of forest renewal is taken into account.

(b) The felled quantity corresponds to the quantity of growth.

(c) The felling is done according to a plan which takes into account the growth, the age structure, and the growing stock of the forest.

The present law covers explicitly only the first definition, whereas the third would be more adapted to the scientific and statistical knowledge that we possess today.¹⁸

Even within these limits, the application of the Private Forestry Law requires a scientific basis. Felling forest in such a manner that the natural regeneration is ensured, is the first stated problem in the law, among many others to imply this. The solution to the problem sounds simple; a certain amount of seed trees have to be left after the felling. But the considerations that determine the detailed solution, involve such factors as the nature of the three species, the structure of the forest, the seedling growth potentiality of the site, and the potential change that it might be subject to, and, finally, the effect and probability of such natural phenomena as storms, forest fires, etc. All this requires knowledge, which a small owner is unlikely to possess.

Thus, the implementation of the law requires the presence of an organization which would control its application and generally inform and assist the smaller owners.

— The control of the application of the Private Forestry Law.

The experts of the Forestry Management Associations usually mark the trees six months before the felling. If felling is done according to such marking, it cannot be considered as a destruction of the forest. (Decision of the Supreme Court of Finland of 18/4/1966). This decision can be criticized on the grounds that the District Forestry Boards which supervise the Forestry Management Associations, do not have the manpower to control all such markings. It would be more sensible, then, to establish whether destruction has taken place on the basis of material rather than formal criteria.¹⁹

The actual provisions for control are contained in the Private Forestry Law. All commercial fellings have to be reported at least three days before their beginning to the District Forestry Board, indicating the location and the size of the area, the quantity to be felled and the starting time for the operation (7 §). This way, the Board has a possibility of

¹⁸ Viljo, T., Vuoden 1967 yksityismetsälaki sekityksineen (The 1967 Private Forestry Law with explanations), Kirjayhtym, Helsinki, 1974, pp. 22-23.

¹⁹ Viljo, T., *op. cit.*, *supra*, p. 132.

warning the owner of the land or of the felling right, if the felling right, if the felling in question would be considered as destruction of the forest. In addition to this, all fellings which require artificial regeneration afterwards, have to conform with a District Forestry Board plan.

When destruction of the forest occurs, such forest can be put under protection and measures be taken for its renewal. The possible costs have to be covered by the owner. To implement this protection, the Private Forestry Law contains several measures. These include the power of the District Forestry Board to order a temporary protection of the forest, and in urgent cases this can be done by a Chief Forester. The final decision about the protection is taken by a court decision, unless an agreement is reached with the owner (10 §).

The forest has to be protected even when the area destroyed is small. In this particular case it was 0.7 hectares (Decision of the Supreme Court of Finland of 7/3/1973).

As it stands now, the Private Forestry Law is preventive and corrective. It aims to preserve the statu quo of the forest balance. But beyond this preservation, which stems from the principle of durability, a new concept has emerged according to which forest lands should be improved.

2) *The forest improvement laws (Metsänparannuslait)*

Forest improvement has to be distinguished from routine forest management. Its aim is to increase the productivity of the forest as efficiently and economically as possible. It includes soil improvement and measures affecting the variety of tree species, the age structure of the forest, and the quality of wood. Connected activities like road building also belong to this category.

Forest improvement requires heavy investment in research, infrastructure, and the actual operations. It also requires a highly competent personnel. But the biggest problem is most likely that of the personal motivation of the owner. Forest improvement globally taken, is vital for the national development. It is the only way to extend the natural limits of this unique natural resource. But it offers little incentive to the small owners, since forest improvement often yields profit only after decades.

This has motivated the passing of the forest improvement laws by which the state gives financial aid to the private efforts of forest improvement.

The first of these was the 1929 Law for reserving funds for forest drainage and for improving totally or relatively unproductive forest areas. This statute law was temporary, established for five years. It provided

state loans and grants for forest improvement. Several laws have since then been passed. This evolution reached its peak with the 1967 Forest Improvement Law (Metsänparannuslaki 15/9/1967/413). Unlike the previous forest improvement laws, this one is permanent. According to it, the state provides loans and subsidies to private forest owners, with the exception of the commercial companies. These funds can be used for the planning and the carrying out of forest drainage ditches, seeding and planting, seedling-stand improvement, fertilizing, the construction of forest roads and corresponding storage areas, consolidation of forest improvement and experimental work, and research connected with forest improvement.

The grants usually run from 50% to 20% of the total cost of the project, being higher in the north than in the south.

The aid has to be applied for at the National Board of Forestry. The Central Forestry Boards can also grant it under certain conditions and when the sum of 1 500 Fmk is not exceeded.

The forest improvement expenditure has increased steadily from year to year. For 1968, the situation was as follows:²⁰

State grants	26.6 million Fmk
State loans	20.2 million Fmk
State financing	46.8 million Fmk
Owner's own financing	39.0 million Fmk
Total	85.8 million Fmk

During this year, 180 000 hectares were covered by forest drainage and 1 300 kilometers of forest road were built.

Forest improvement is considered to be in line with the multiple-use principle. For instance, forest roads favor outdoor recreation by permitting better access to the forest.

The effect of forest improvement on ecology is both negative and positive.

Forest drainage destroys the peatland ecology, including all animal species that depend on it for their habitat. But it also provides a fertile

²⁰ It is generally calculated that the investment will be amortized over the following periods after the initial investment: — reforestation — 30 — 100 years. — fertilization — starting from 7 — 10 years after, when applied in the later stages of growth — forest drainage — same as in reforestation, except for peatland with trees, where returns will start immediately — forest roads — some returns immediately; complete amortization at the latest in 5 — 12 years. It has to be noted, also, here that a forest holding will change owners on the average of every 14 years in Finland.

ground for hardwoods and mixed forest and a good habitat for different mammals and birds.

Intensive reforestation can spoil the landscape and cause soil degradation if too heavy plows are used. But it also offers a possibility of increasing the genetic variety of the forest. And the increase of seedling-stands and young tree generations in the overall age structure of the forest, favors certain animal species such as the deer, the hare, and the heathbird.

There is comparatively little fertilization in forestry, compared with the quantities used in agriculture. The small amounts do not seem to have any adverse effects on the forest ecosystems. There is, however, some indications that animals have died of fertilizer poisoning. On the other hand, fertilization seems to help the survival of certain tree species in difficult growing conditions. However, extensive research is still required to know this problem better.²¹

B. The State-owned Forests

The state owns about 24.7% (8.26 million hectares) of the total Finnish forest area.

The possibilities for economic exploitation are limited by several factors.

The public interest requires the state to use part of the forest land for non-economic purposes. The total area of protective forests, national parks, virgin forests, nature management forests, research forests, seed orchards, future construction sites, and other areas of general interest, add up to 2.79 million hectares.

Most of the state-owned forests are situated in Northern Finland where the growth is slow and the forest relatively unproductive. Of the 5.47 million hectares which can be qualified as economic forest, only 3.25 million hectares is productive forest.

98% of the state-owned forests are managed by the National Board of Forestry. As we have seen, its responsibilities are determined by the Law on Forest Administration of 1966.

The Board has to promote all forest economy, whether private or public, orientating it towards maximum productivity, while observing the sustained yield principle (1 §). The same applies for the forests managed by the Board. Moreover, it is specified that the Board should strive for maximum commercial efficiency in its management (3 §). The Board is empowered to commercialize wood taken from the state-owned forest (8 §).

²¹ Metsälautakuntien tiedote N:o 2/1970, pp. 17-19.

As far as the sustained yield principle is concerned, the past performance of the Board is not entirely satisfactory. In the 1960's, the total drain constantly exceeded the allowable cut in the state-owned forests. Between 1960 and 1966, this excess was on an average of 13% a year. After 1966, it dropped to a constant 4% of the allowable cut.²² This was partly justified by the abundance of old tree generations in the state-owned forests. But the Board has also been criticized for the use of too indiscriminate cutting methods.

The real importance of the state-owned forests cannot be analysed only in terms of commercial achievement. This sector has to be looked upon as a regulator of the forest economy in the sense that it offers reserves for the protection of the nature, the raw material needs of the wood processing industry and a means to limit unemployment. It also offers an opportunity to monitor the forest economy as a whole because of the National Forestry Board's role as a promoter of the whole industry and as a producer on its own.

C. The Emergence of a National Planification in Forestry

The 1950's and the 1960's were characterized by a rapidly increasing output of the wood-processing industries. The new higher level of demand for raw material was compensated, to a certain extent, with imports from the Soviet Union and various measures of rationalization, such as cutting down the use of the wood for domestic fuel and reducing the exports of roundwood. But despite these measures, the sustained yield principle was violated by too extensive fellings.²³

Between 1955 and 1964, the forest balance (the difference between the allowable cut and the total drain) was constantly negative. In 1961, it reached a peak loss of 8.6 million m³ of solid measure, unseasoned wood with bark. Since 1965, it has been on the average positive.

The crisis was partly caused by structural inadequacies of the forest economy as a whole. The most notable of these were the predominance of small forest holdings and the slowness of the public authorities to react to the new trends.²⁴

Besides the economic and technical measures which ended the crisis on short-term basis, some fundamental reorganization and innovation was undertaken.

²² Linnanmies, O., *op. cit.*, *supra*, p. 128.

²³ Holopainen, V., *op. cit.*, *supra*, p. 18.

²⁴ *Ibid.*, p. 12.

The legal and administrative reorganization was done with a series of statute laws. These were the Law on the Forest Administration in 1966, the Law on Forestry Boards, the Private Forestry Law, and the Forest Improvement Law in 1967.

But the most significant was the emergence of the first efforts in the national planification of the forest economy. Several studies were made to determine what could be the maximum potential productivity level of the Finnish forests, according to the sustained yield principle and what would be the forest improvement measures to be taken to achieve that level of production.

In 1961, two studies were completed: one called the HKLN-program, made by the State Committee for Forestry (Metsätalouden Suunnittelukomitea), and another one called the TEHO-program sponsored by the State Agricultural Committee (Maatalouskomitea).

The effective realization of these programs have encountered financial difficulties. The objectives of the HKLN-program were eventually reached. But the budgets that provided for the application of the forest improvement laws were too small to satisfy the needs of the growing wood processing industry and to fulfill the objectives of the more ambitious TEHO-program.

To solve this problem, the Finnish Forest Financing Committee (known as the MERA committee), was founded in 1964, by the Bank of Finland, the National Board of Forestry, the Central Forestry Board Tapio, and the Forestry Council of the Central Association of Finnish Agricultural Producers, and the Central Association of Finnish Wood Processing Industry. It worked out a plan which was based on the TEHO-program and which formulated a financing plan for the 1965-1970 period. This became known as the MERA plan.

It was amended in 1966 (MERA II). A new MERA III plan was established for the 1970-1975 period. It represents the particularities of being partly financed by a World Bank loan and being based on a new study made in 1969.

This was a study made for the Economic Council of Finland (Talousneuvosto), examining Finland's potential timber production during the period of 1970-2015. It revealed that the forest balance was in disequilibrium, fellings in certain parts of the country exceeding the allowable cut, and in others being lower. It also proposed four alternative plans, each proposing more extensive forest improvement measures than the previous one. The projected allowable cuts according to these plans are as follows:

Allowable cut, millions of m³ without basic

	1970	1980	1990	2000	2015
Basic program	52.6	53.2	53.6	57.3	61.9
Minimum program	52.8	55.3	56.7	61.2	66.2
MERA program	53.6	58.7	64.3	69.3	80.2
Maximum program	54.1	62.1	67.8	71.8	87.7

The Basic program is based on the assumption that the 1968 level of forest improvement is maintained. The MERA program is the currently adopted one.²⁵

In practice, the program has been overambitious. Neither the financial nor the basic forest improvement objectives of the program have been reached. For 1972, we have the follow statistics:

<i>Type of work</i>	<i>MERA III</i>	<i>Accomplished</i>
Seedling and planting 1000 hectares	200	141.2
Seedling-stand improvement 1000 hectares	280	279.3
Forest fertilization 1000 hectares	337	223.5
Construction of forest roadst-km	5890	2963

The relative failure of the MERA plan can be attributed partly to its weak institutionalization. Subsequently, it can be said that:

(a) The forest improvement legislation is not adapted to the scope of national planification. Mainly, the incentives offered to the small owners are not sufficient.²⁶

(b) The Finnish forestry planning is still in its infancy. The MERA plan is largely a result of non-governmental efforts. It is vaguely accepted as national policy, but at the same time the government criticizes it as being too costly. In many respects, it considers agriculture more important. The state financial aid for agriculture was, for instance, in 1970, almost the same as the projected public expenditure for the whole MERA program from 1970 to 1975. The government should take a more rigorous stand. The best would be to adopt the MERA plan or the same plan modified in form of a statute law, which would stipulate that the plan should be

²⁵ Linnanmies, O., *op. cit.*, *supra*, p. 87.

²⁶ Holopainen, V., *op. cit.*, *supra*, p. 43.

carried out through a contractual policy. This would be more adapted to the present ownership structure than a plan with obligatory production norms.

III. SOME IDEAS RELATED TO THE PROBLEMS OF DEVELOPMENT

Experience such as Finland's in this field, is never directly transferable because of differing conditions. But it behooves us to make certain general remarks which do not attempt to constitute any systematic plan.

A) The Concept of Environment

This concept has to be understood in terms of the newly-accepted formula which combines an adequate level of material development with the prevention of the degradation of nature.²⁷ The function of the legislation is to provide the formalization of the policy which will combine development and the protection of nature and natural resources. The basic requirement is that the legislation has to be effective and, above all, not a sterile copy of a model offered by a developed country, which unfortunately has sometimes been the case.

B) The Use of the Land

The departure point of any sound forestry legislation should consist of determining what are going to be the future uses of the land. This implies, of course, that extensive multidisciplinary research has to be done on the subject, and that the adopted solution has to be combined within the general framework of the national plan.

The first step is to determine the limits of the forest land. In practice this is often a question of determining the eventual limits of agriculture; a very difficult problem because of the constantly worsening food shortage in the world.

The next step would be to determine the actual uses of the forest land. Here, the Finnish model might be useful, with slight modifications. This division would be as follows:

²⁷ As in the Declaration on the Human Environment, the United Nations Conference on the Human Environment, Stockholm 5-16 June 1972, especially principles 8 and 9.

THE FINNISH FOREST

- Protected forests
- Protective forests
 - National parks
 - Wildlife reserves
 - Strict nature reserves
 - Research areas

Economic forests

Each single area in the different categories of protected forests should receive a specific status, determined by the purpose of that area and the ecological conditions prevailing in it. The economic forests could be treated as one single entity from the legislative point of view.

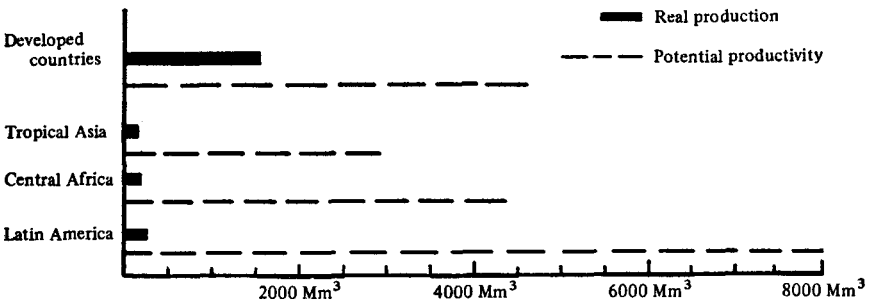
National parks and wildlife reserves, although both partly destined for tourism, represent different management problems and should be separated.

The provision of special research areas is very important because of the lack of knowledge on the considerably complex tropical ecosystems.

Protective forests should be given special attention because of their function to stop the advance of the desert lands.

C) The Particular Geographical Conditions of the Developing Countries

Compared with the countries which are presently the main producers of wood and wood products, the developing countries have tremendous resources.²⁸



The tropical forest, which constitutes half of the world's total forest area and is almost completely situated in the developing countries, represents particular problems.

²⁸ Viers, G., *Géographie des Forêts*, PUF, Paris, 1970, p. 97.

Because of the fast growth and the density of the vegetation in the tropical forest, it has a higher potential productivity than any other type of forest. But of the rich variety of tree species, only few have a commercial export value. These trees grow isolated, which gives the forest exploitation a character of treasure-huntig, complicated by the practical problems of transportation. Intensive forest improvement is needed here to raise the quality of the general growing stock. In a parallel manner, solutions should be found to process the less valuable wood locally.

The fragility of the tropical forest ecosystem invites extreme precaution and should be considered by the legislator. The soil is poor containing little humus and being easily leached empty of minerals and nutrients. Intensive fellings, especially if the area is converted into agricultural land, starts often an irreversible process. The area is transformed into savanna and eventually into desert.

D) Some Legal and Administrative Considerations

It would be necessary to have a central forestry administration which would manage state-owned forest land and control the use of other forest land, carry out research and formulate general policy. Eventually, if need be and if the necessary personnel exists, intermediary organizations on a regional level could be established.

On the local level, the legislation should take into account the communal form of organization, which is common in the developing countries.

Since traditionally, these groups have lived in autarchy, they are not motivated to undertake actions which do not seem to have any visible or immediate interest for them. This, combined with the lack of experts, makes it practically impossible to legally enforce such relatively long-term action as forest improvement. The forest laws should be mainly negative in nature, consisting of simple prohibitions which would protect the forest from excessive felling. Positive actions should be rather taken by state-organized projects which would permit the efficient concentration of qualified personnel and of capital.

The communal organization can be useful in that it offers an inherent source of authority which is recognized and respected by its members. Thus, it is important that policy options formulated in obligatory statute laws and administrative decisions, are accepted by the local authority. The legislation should confer the necessary authority to the appropriate local instances.

This could be supplemented by such measures as giving to one or a few persons from each interested community, a short training covering

the essential elements of forestry. This person, especially if he has no authority position within the traditional hierarchy, could act on purely consultative basis. What is needed, is a go-between who would convey the decisions and statute laws of the center of decision of the country to the local community and inform the central authorities of any violations of the regulations that have taken place. Any punitive measures would be organized by appropriate criminal legislation, applied by normal judiciary system and police authorities.

Another way to convey information and to control activities is offered by the one-party system frequently used in the developing countries as an instrument of development and mass instruction.

E) The Ownership Structure

The relative inexistence of the private property of land in the developing countries, offers possibilities to establish large exploitation units. The task of the legislation would be to prevent the division of the land into small holdings, a practice which could be disastrous for forestry. Legislation should favor large units, whether then under state management, managed by private companies, or organized on communal or cooperative basis.

On the communal level, it would be interesting, for instance, to combine agriculture and forestry.

Private companies can be useful in that they can offer the concentration in capital and know-how which the local population does not possess. But, also, here adequate legislative controls are needed to prevent the degradation of the forest balance.