Forestry policies in Europe

An analysis

FAO
FORESTRY
PAPER

92

FOOD
AND
AGRICULTURE
ORGANIZATION
OF THE
UNITED NATIONS

Forestry policies in Europe

An analysis

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M-36
ISBN 92-5-102902-4

FOREWORD

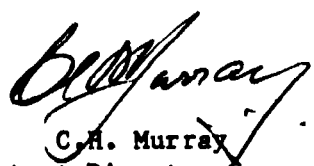
This publication is a sequel to the Country Reports on forestry policy which were published in FAO Forestry Paper 86 in 1988. It analyses the major problems confronting forestry in Europe and discusses the range of policies, legislation and administrative measures which have been adopted or are under consideration. The analysis also points to aspects of policy which have hitherto received insufficient attention in many countries, for example the integration of forestry policy with broader economic environmental and social policies and the need to ensure that policy implementation matches the stated objectives.

The publication is intended to assist legislators and administrators as well as woodland owners and all those concerned with ensuring that national forestry policies in Europe keep abreast of the changing demands being made on forests by society. Above all, there is the need to reconcile the growing emphasis on the environmental and recreational roles of forests with the continued cost-effective production of wood and other forest produce.

Policies which have proved successful in one country may, of course, be less suitable in another; nevertheless, the analysis confirms that European countries could benefit much more from each other's experience than has been the case to date. It is hoped that this publication would facilitate and encourage this exchange.

The contribution of the analysis to cooperation within Europe is twofold: it identifies forestry policy objectives which the countries of Europe have in common, and it defines those policy issues which cannot be dealt with adequately at national level alone and, therefore, require attention at regional or pan-European level.

The analysis also provides pointers to appropriate action in other parts of the world because some aspects of forestry policy formulation and implementation present problems that are by no means confined to Europe.



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INTRODUCTION

Purpose

This publication reviews the policies by which the countries of Europe intend to take forestry into the 21st century. Forest industries and the timber trade will be considered primarily in relation to the main theme. The countries have reached a broad consensus on objectives, but not on the policies required to achieve them. This is not surprising because forestry policies necessarily reflect a country's history, geography, culture, social conditions and political system. Taking these influences too much for granted may, however, inhibit healthy innovation.

That danger may be countered by becoming better acquainted with the policies adopted elsewhere and by closer international collaboration where this is in the mutual interest. It is hoped that this publication may help to point the way.

Background

The European Forestry Commission (EFC) of the Food and Agriculture Organization of the United Nations (FAO) decided at its 22nd session, in Budapest in 1985, that forestry policies and the questions connected therewith be examined periodically. This publication is in response to that decision. Four related steps have already been taken:-

(1) All Member States of the EFC except Iceland, Malta and Romania prepared reports on their national forestry policies, legislation and administration using guidelines suggested by FAO; there was also a contribution from the USSR.

(2) FAO has published summaries in English of the above Country Reports, highlighting points of wider than purely national interest.

(3) A book containing another set of national reports dealing primarily with timber trends and prospects has been published under the title:

"Forestry and the Forest Industries: Past and Future"

(ed: E.G. Richards, published in 1987 for the United Nations by Martinus Nijhoff Publishers). The origin of that book lies in the decision taken by the Timber Committee of the United Nations Economic Commission for Europe (ECE) and the European Forestry Commission to hold a joint session in October 1987.

(4) At that joint session in Geneva the findings of the FAO/ECE study "European Timber Trends and Prospects to the Year 2000 and Beyond" (ETTS IV) were received and a declaration was approved the conclusions of which are reproduced below.

Conclusions of Geneva Declaration

"The FAO/ECE study European Trends and Prospects to the Year 2000 and Beyond provides clear indications that the forest and forest industry sector as a whole will continue to grow in importance, but that demand for the social and environmental benefits of the forest will rise faster than

that for wood. This may have consequences for wood production. Nevertheless, Europe by the end of the century will use more sawnwood, wood-based panels, paper and paperboard and energy wood than it does today. The rate of growth in wood use will be lower than predicted in earlier studies. On the other hand, the supply of wood from Europe's forests is expected to rise in line with earlier forecasts, while still remaining below the potential of these forests. Recycling of industrial wood residues and waste paper will continue to expand. On the basis of the expected export potential of overseas suppliers to Europe, its net imports may rise but not to the extent of significantly reducing the region's level of self-sufficiency in forest products.

In short, it is foreseen by ETTS IV that in the coming decades supply of wood and its products to the European market will be adequate to meet the expected growth in demand, provided the planned afforestation and reafforestation efforts and intensified management are in fact realised. At the same time, pressure on the forest resource will continue from two directions: increasing demand for social and environmental benefits; and threats to the health and productivity of the forest from damaging agents, notably fire and air pollution.

Policy makers are faced with the challenge and opportunity to adapt policies to the changing conditions as described in ETTS IV. Strategies must be developed that will allow the full potential of the forest to be utilised in an integrated way, so that their multiple functions are made available for the welfare of society. Action is particularly called for in the following areas:-

(a) The growing relative importance attached to the non-wood functions of the forest demands in some countries the adoption of new and integrated approaches to the formulation and implementation of forest policy. Attention should also be given to the question as to whether existing sources of revenue - mainly from the production of wood - provide sufficient incentive to generate the necessary changes in direction of forest management and/or how far eventual financial compensation has to be paid for the obligation to manage for the public.

(b) Damage caused to the forest by fire, air pollution and other agents such as game or grazing results in the long-term deterioration of the environment and losses in many other ways. Recent international surveys confirm that in large parts of the ECE region the number of trees affected by air pollution, both coniferous and non-coniferous, remains intolerably high. Measures for the protection of the forest deserve very strong support, especially those directed to the reduction of the causes of damage, notably emission of air pollutants. International co-ordination of research should be strengthened in order to avoid duplication and to stimulate complementary programmes.

(c) Trends in agriculture in certain regions could lead to the transfer of some agricultural land to other uses. Provided the land's potential is respected and a balance in rural land use maintained, this offers a major opportunity for the forestry sector to developlong-term strategy that will ensure that afforestation blends into an overall rural land-use policy and, through careful planning, to provide economic benefits to local communities and the forestry-forest industry chain. To encourage conversion of agricultural land to forestry, it may be necessary to keep open the possibility for this land to revert to non-forestry uses.

(d) In some countries, it was considered that the growing need of society for forest products should encourage governments to promote the wider utilisation of forest resources and also the fuller and more effective utilisation of all extracted biomass, including low quality timber and wood wastes.

(e) Governments need to define the role that the large number of small forest holdings could and should play in contributing to society's needs in general and rural development in particular. Having defined that role, they should provide active support to the strengthening of management, especially through extension services and other forms of support.

(f) The forest and forest industry sector should take up the challenge to improve the marketability of its products, by improving information on structural developments for markets and end-uses, by investing in research and development, by more aggressive promotion and marketing strategies and by greatly extending education and training in the use of forest products.

(g) Policies for wood-based energy development should be pursued, since it can be expected that changes from the present energy situation will, sooner or later, result in renewed interest in wood as a source of energy. Market information should be made available to enable suppliers and users of wood to make the best use of available resources.

(h) In some countries, governments have an important role to play in promoting the dynamic development of the forest and forest industry sector by encouraging better communication and understanding amongst its various components and promoting greater co-operation in furthering common interests.

(i) Governments should actively encourage greater well balanced public participation in the policy-making process for the forest and forest products sector and take steps to strengthen the public's and legislators' understanding of the complex issues involved.

Finally, it is not sufficient to make policy: it must also be implemented. This implies a strong institutional framework in the member countries, backed by full political support. Given the long-term nature of forestry, stability should be encouraged and unnecessary changes avoided".

The approach

As the Geneva Declaration has been approved by all participating governments, its conclusions have been accepted as the standard by which to judge national forestry policies. In the treatment of the subject matter it was, however, found convenient, instead of following the sequence of headings in the Declaration, to follow the sequence adopted in the Country Reports which have been the main, although not the only, source of information. Other sources were particularly useful on points which some countries have discussed as policy issues but others have ignored either because the relevant decisions are taken too much for granted to deserve a mention or because the points are not considered a matter of policy.

As statements of policy mean little unless they are backed by the administrative, legal and financial measures required for implementation and enforcement, these measures have been included in the present review.

Complete coverage has been precluded because three countries did not produce reports and most other countries omitted some topics from theirs. The approach has, therefore, been to discuss under each heading the range of situations, problems, options and policies reported and to quote examples to illustrate particular measures and views.

Chapter 9 on international co-operation and the role of international organizations deals with the subject from the national standpoints. The objectives and policies of the international organizations were not stated in the Country Reports and could therefore not be discussed in the present context. The final Chapter 10 is devoted to some general conclusions and recommendations.

1. FORESTS - OWNERS - OBJECTIVES

1.1. The forests

The forests of Europe bear the imprint of man's activities over the centuries, in some instances over millenia. At one extreme there are the recent plantations of fast growing exotic species such as Douglas fir, Sitka spruce and radiata pine from North America or eucalypts from Australia; at another extreme there are woodlands that are virtually abandoned either because they have been devastated by over exploitation followed by erosion or because they no longer fulfil their original purpose; the millions of ha of coppice woodlands originally managed to provide fuel for the home and for industry are a case in point. At yet another extreme there are relics of untouched virgin forest which until not so long ago had been regarded as a wilderness yet to be conquered but are now recognized as a precious heritage of the past to be protected and preserved in perpetuity.

Most forests are, however, managed to produce timber and to achieve environmental and social objectives; they generally consist of a limited range of indigenous species, complemented here and there with promising exotics.

With a closed forest area of 145 million ha (excluding the USSR) and an annual production of 353 million m^3, Europe accounts for only 4% of the world's closed forest area, but for 11% of world production of timber. Nevertheless, the average production in Europe of about 2.5m^3/ha/yr falls far short of what could be achieved, even allowing fully for environmental and social constraints. In some countries average production has, in fact, already reached 4m^3/ha/yr or even more. Improved forest management and afforestation in recent decades have brought about increases in timber production throughout Europe and this trend will continue under existing policies. The question now arises whether these policies should be reviewed bearing in mind that the region as a whole (excluding the USSR) is already nearly self sufficient in forest products and that the Geneva Declaration concludes that demand for these products is likely to grow more slowly than had hitherto been expected. Clearly, appropriate action will vary from country to country and depend on facts such as the degree of national self sufficiency already achieved and the ability to compete on the world market.

Forestry in the USSR is on an entirely different scale. Its closed forest area of about 800 million ha is more than five times the forest area of all other European countries combined; the problems too are rather different because a very large proportion of the forests are situated not in Europe but in sparsely populated regions of Siberia which are remote from markets and where the harsh climate restricts the rate of growth. Nevertheless, annual production at about 360 million m^3 is similar to that of Europe and is capable of being increased.

1.2. Ownership

The pattern of forest ownership in Europe varies greatly. In countries with centrally planned economies, forest ownership was a major policy issue which was solved by the nationalization of most forests; some

areas, however, were placed or left in the ownership or occupation of agricultural cooperatives or similar organizations. In Hungary, cooperative farms account for 30% of the total forest area and in the German Democratic Republic (GDR) for 27%; elsewhere the proportion is much less although in absolute terms the area can be very significant: thus in the USSR the 0.2% of the forest area classed as collective farm forests adds up to nearly 19 million ha. Ownership by individuals remains significant in Yugoslavia where farm forests account for about one third of the total forest area. Small areas in individual ownership are also reported from the GDR and Poland.

In countries with market or mixed economies, ownership is generally more widely spread and government influence on owners is less pronounced or absent. All these countries have state forests: less than 5% in Portugal and Spain, and as much as 98% in Israel and 85% in Ireland. They also have forests that are owned by individuals. France alone reports over 3 million private woodland owners, and several other countries over 500,000. Other classes of ownership are also common (e.g. industries, local communities, various institutions).

The political significance which countries, both East and West, attach to different categories of forest ownership may be deduced from their classification of forests. The simplest classification is that of the United Kingdom where all forests not belonging to the state are simply classed as "private" even if they belong to forest industries or to public bodies such as counties. The main classes of ownership reported by various countries are as follows:

- state: (all countries) some countries differentiate between central government and regional governments (e.g. Federal Republic of Germany (FRG), Italy, Spain, Switzerland, Yugoslavia);
- public bodies such as Communes (e.g. Belgium, Cyprus, France, Luxembourg, Switzerland);
- institutions: (ecclesiastical, academic, financial etc.);
- cooperative farms, collective farm forests etc. (mainly countries with centrally planned economies);
- workers cooperatives: (e.g. Portugal);
- non-governmental conservation organizations (e.g. Netherlands, UK);
- forest industries (e.g. Sweden [24% of forest area], Finland [8%], Portugal [4%]);
- ownership by individuals: (all countries with market or mixed economies)

Only a few countries have commented on the policy implications of forest ownership. The views expressed may be summarized as follows:-

State forests: Being under direct state control, policy implementation is easy especially as these forests are usually in sufficiently large units to permit rational management by properly qualified staff; moreover, since all the costs are borne and all the benefits are reaped by the whole population, conflicts of interest between forest owner and society are minimized. On the other hand, the dead hand of bureaucracy tends to prevent forest managers from exercising the degree of initiative that is required for good management. This difficulty is

reduced in some countries, both East and West, by giving the state forestry enterprise a certain degree of autonomy instead of treating it as a department of a ministry. This point will be elaborated under "administration".

Public bodies (communes, etc.) combine some of the advantages of state ownership with the advantage of closer direct involvement of rural communities. In countries where this form of forest ownership is common, management is usually undertaken by the state forestry authority or, at any rate, closely supervised by it. Similar considerations may apply to cooperative farm forests.

Forest industries. Forest management by forest industries is generally of a high standard and enables the requirements of industry and forest to be closely attuned to each other. It is, however, worth recording that Sweden and Finland, the two countries where this class of ownership is significant, while recognizing the advantages of this ownership, have decided to limit its further expansion. One reason is the fear that large-scale ownership by forest industries may accentuate the imbalance in bargaining strength that exists when a few large and powerful industries purchase wood supplies from many small woodland owners. In Finland, the transfer of land from private to company ownership is also reported to have resulted in a number of social problems. For instance, the owners of holdings remained as tenants on the farms bought by the companies or were left without livelihood.

Private Ownership. This category of ownership is itself extremely varied, ranging from a few estates with thousands of ha of forest to the millions of holdings with less than 5 ha. However, nearly all the owners have two characteristics in common: their forests are not their main source of income and their interests may not always coincide with national interests. Especially the smaller owners tend to look for an earlier return on their investments than society and they have little incentive to welcome the public into their woodlands free of charge. The standard of mangement on the larger estates is generally high; in fact some of the best silviculture in Europe is to be found on these estates which are usually managed by qualified forestry staff or by the owners themselves whose motives obviously vary. Safety of investment, love of nature, pleasure of ownership, prestige, social conscience, desire to excel, all are said to play a part. In the millions of small forest holdings the situation is very different. There are several reasons. In the first place, most small woodland owners lack the incentive and the forestry training. The greatest obstacle to efficient management lies in the fact that a small forest holding cannot be managed economically on its own. The planning, construction and maintenance of forest roads can only be done cost-effectively for substantial areas of forest, especially in mountainous terrain, and even individual forestry operations using modern technology cannot be carried out economically on a very small scale. Countries have adopted a series of policy measures to counteract the problems of fragmented ownership. They include:

- schemes to promote groupings or other forms of cooperation between forest owners,

- improvement of extension services,
- assistance with marketing,
- training facilities,
- financial incentives,
- measures to promote land consolidation,
- management under contract by forest management enterprises or by forest industries.

Perhaps one of the most effective measures has been management or at any rate close supervision by the forest administration as practised for example in Switzerland and Yugoslavia, but the resulting restrictions on owners would not be acceptable everywhere.

One question that perhaps deserves more serious consideration than it has received is whether some of the neglected woodlands are not performing a valuable environmental function as habitats and refuges for endangered fauna and flora, and that absence of management may, in fact, save some species from extinction. It is, therefore, encouraging that some countries have introduced or are planning schemes to pay woodland owners for dedicating suitable areas to the conservation of existing vegetation.

No country has reported a policy to bring about major changes in the ownership of existing forests and one country, Yugoslavia, where one third of the forests are in private ownership, states specifically that there is no administrative influence on ownership changes. Limited purchases by the state or other public bodies of private woodlands that may come on the market are envisaged by some countries. Sales of forests by the state are unusual but, in Britain, the Government recently sold off some state forests and, in June 1989, it announced its intention to sell another 100,000 ha by 1999.

The forest areas in both private and public ownership will continue to increase in many countries through afforestation which will be discussed in more detail in Chapter 4.

1.3 Principles and objectives

There is a general consensus in Europe that forests should be protected and managed as a renewable resource to supply products and services which contribute to the welfare of all citizens now and in the future. The main objectives are:

- a sustainable increase in the economic availability of timber and other forest products;
- the conservation and, where practicable, the improvement of the environment;
- the provision of opportunities for recreation.

Where practicable, these objectives are pursued in conjunction with one another by multiple use management, the weight that is attached to each objective being varied according to the particular circumstances at a given place and time.

Many countries report an increasing emphasis on the environmental and recreational roles of forestry and a growing awareness that forestry policy should be concerned also with the survival of the many species of forest flora and fauna which are of no immediate use to mankind. The reasons are:

- uses may be discovered in the future;
- the disappearance of a species may have wider ecological repercussions;
- the extinction of a species by man is considered wrong in principle.

Forestry measures, however, which may oust a species from a particular region by changing the habitat continue to cause controversies between foresters and environmentalists as well as among foresters themselves.

The national forestry policy objectives reported thus correspond broadly to the conclusions of the Geneva Declaration reproduced in the introduction, although countries differ in the emphasis accorded respectively to the productive, protective, environmental and social functions of forestry. One country, Albania, has added the objective of replacing wood with other materials as a means of reducing the wood deficit.

Some countries have a formal declaration of forestry policy objectives anchored in law, while other countries have preferred a more informal approach so that the objectives must be deduced from legislation, ministerial statements and actions by the forestry administration. The formal declaration adds weight to proposals put forward in support of particular objectives while the informal approach has the advantage of being more flexible. Indeed, it is difficult to formulate objectives that are sufficiently precise to be meaningful and yet not so detailed as to require frequent change.

Only France has made a clear distinction between principles and objectives, but as the principles enunciated are widely applicable, they are summarized below:-

"Forestry policy is

- comprehensive so as to embrace the ecological, economic and social functions of the forest;

- long term so as to pass to future generations an improved forest heritage;

- continuous and independent because the choice of investment follows from decisions, the logic of which is independent of economic cycles and political hazards;

- contractual because of the mutual obligations between forest owners and society."

The discrepancies between national policy objectives and the objectives of individual forest owners are dealt with in most countries by "the carrot or the stick" or a combination of both. For example, owners may be paid for allowing visitors into their forests (e.g. Netherlands) or they may be obliged by do so by law (e.g. Sweden, Finland, FRG).

2. ADMINISTRATION

2.1 Ministerial responsibility

In Europe, forestry usually comes under the minister who is also responsible for agriculture. The arrangement takes advantage of the close links between farming and forestry in land use, employment and rural development. The main disadvantage is that farming may steal the political limelight so that forestry loses out whenever there is a conflict of interests, e.g. in the allocation of funds. This point is expressed bluntly by Italy: "There were two reasons for no longer including forestry in the National Plan for Agriculture: first, forestry differs markedly from agriculture in its characteristics and functions; and secondly, forestry tends to be treated as a residual appendage when combined with agriculture".

For the above reasons, as well as for others, some countries have adopted different arrangements. In the USSR, the supreme state organization is the State Committee for Forestry (GOSLESHOZ). In the republics and autonomous regions of the USSR there are ministries or state committees for forestry, e.g. in the Russian Federation there is the Ministry of Forestry and in republics with small forest resources such as in Kirgiz SSR, there is a State Committee for Forestry.

In Denmark, the responsibility for forestry is divided between the Ministry of the Environment (which controls most activities including the management of the state forests) and the Ministry of Agriculture (which administers the support of private forestry, forestry research and training at technical and vocational levels). The Ministry of the Environment is responsible for forestry in Luxembourg, the Ministry of Energy in Ireland (until 1987 it was the Ministry of Tourism, Fisheries and Forestry) and the Ministry of the Interior in Switzerland. In Sweden, forestry comes under the Ministry of Agriculture, but the State Forest Enterprise (DOMANVERKET) which manages the state forests is responsible to the Ministry of Industry. In Britain, the Forestry Commission is responsible directly to three separate ministers (but not to their ministries), namely the Minister of Agriculture in England, the Secretary of State for Scotland and the Secretary of State for Wales. In Israel, forestry comes under the autonomous Land Development Authority.

In Belgium, the responsibility for forestry was transferred to the regions in 1980 and only international relations have remained under national control in a small unit that is attached to the Department of Natural Resources and the Environment. The Country Report states that as no coordination between the regions is envisaged, their forestry policies will diverge.

Some forestry circles hold the view that having a minister with responsibility for forestry and forest industries would be the best arrangement in countries with a substantial forest resource. Even in these countries, however, forestry is rarely held to be of sufficient importance to warrant such an arrangement; and closer links between forestry and forest industry would inevitably be at the expense of links between forestry and other land uses on the one hand and between

forest-based industries and the industrial sector as a whole on the other hand. Hungary is an example of a country where the Office of Forestry and Forest Industries, which is located in the Ministry of Agriculture and Food, combines both functions.

The available evidence suggests that the allocation of ministerial responsibility for forestry is less important than:

- forestry policies with a coherent view of the sector as a whole;
- clear definition of responsibilities, especially where more than one minister is concerned; division of responsibility inevitably makes efficient administration more difficult;
- the amount of attention which the minister(s) responsible can devote to forestry;
- the seniority of the minister(s) concerned;
- sufficient autonomy for the forest service (or services) to operate efficiently; that applies particularly to the management of the state forests.

2.2 The forestry services

Forestry services will be discussed under three headings: (1) distinction between forestry authority functions and state forest management; (2) the question of decentralization; (3) structure.

2.2.1. Forestry authority and state forest management functions

The distinction between the forestry authority and the state forest management functions is relevant not only because of the differences between the two functions but also because in some countries they have been entrusted to different organizations.

The forestry authority advises government on forestry policy and supervises its implementation in all forests, whatever the ownership. The responsibilities generally include the enforcement of forestry legislation, the administration of incentives, relations with other government departments and with non-governmental bodies as well as the public. The forestry authority also is usually concerned with forestry research and training, nature conservation, and with international cooperation in forestry. These largely advisory, regulatory and supervisory duties contrast with the executive activities involved in managing the state forests which in some countries (e.g. Sweden) constitute the State Forest Enterprise, and fall broadly into two categories:

- state forests that are primarily managed for the production of timber (with due regard of course to environmental and social considerations);
- state forests that are managed primarily or exclusively for the conservation of nature, as in national parks or nature reserves (all countries have reported such forests).

Traditionally, governments in Europe had a single forestry service to act as forestry authority and to manage the state forests. This generally

remains the case where the state forests constitute either a very large proportion of the total forest estate, as in most of the countries with centrally planned economies, or a very small proportion as, for example, in Italy, Portugal, Spain and Switzerland. Countries where ownership is less unevenly divided have tended to opt for separate organizations. Examples are France, Finland and Sweden. There are, however, exceptions. Thus Norway, where most forests are privately owned, has a separate organization for its public forests while the FRG and UK, where state and private ownership is more balanced, have a single organization which combines the forestry authority and forest enterprise functions.

The arguments adduced in favour of placing at any rate the commercially managed state forests into a separate state forest enterprise are:

(i) the management of an enterprise and the regulatory functions of government call for procedures and attitudes which are difficult to combine in a single organization;

(ii) possible conflicts of interest between the forestry authority and forest enterprise roles are avoided; The state forest enterprise and private growers may, for example, be in competition for land for afforestation or for timber markets.

The counter arguments adduced in favour of having the state forests managed by the forestry authority are:

(i) there will be a saving in personnel and other administrative costs, especially in countries with limited or widely dispersed forest resources;

(ii) forest officers who manage forests themselves are in the best position to understand the problems of forest owners and to act accordingly.

The trend in recent decades has been towards a separation of forestry authority and state forest enterprise. The most recent example is Ireland which made the move in 1987. This trend may continue as the forestry authority function becomes more complex and the call for the economic management of state forest enterprises more acute.

2.2.2 Decentralization

Much of Europe has recently witnessed a surge of demand for the devolution of power from national level to more local levels and, in some instances, this centrifugal tendency has been accompanied by a desire for greater cooperation at European level. Not surprisingly, forestry has been caught up in these trends.

Decentralization is most pronounced in countries with a traditional federal structure such as Belgium, FRG, Switzerland, USSR and Yugoslavia or where regionalization has recently been introduced or re-introduced as in Italy and Spain. By contrast, forestry administration is highly centralized in Britain and a few smaller countries such as Cyprus and

Luxembourg. In some countries a single organization manages the state forests in the whole country while the forestry authority functions are divided between a central forestry authority and regional administrations over which the central authority can sometimes only exert indirect and limited influence. Austria and France are cases in point.

Forestry authority functions which sometimes continue to be exercised centrally after regionalization include research, training, national forest inventory, forest statistics and international relations. In Italy and Spain, forests specifically dedicated to nature conservation have been retained under national management after the responsibility for other public forests was transferred to the regions.

The only country that reported an intention to strengthen central control over forestry is Switzerland where legislation is being introduced to give the central government more powers to ensure that the cantons comply with federal forestry policy.

The implications of decentralization are obviously different for a republic in the USSR with over 10 million ha of forest and for a Swiss canton with less than one hundred thousand ha. The implications also differ according to the number of decentralized units, e.g. two in Czechoslovakia or some 20 in Italy.

The decentralization of the forestry authority functions facilitates adaptation to local circumstances and integration with other sectors of the local economy; on the other hand, the enforcement of central policies and directives is rendered more difficult or even impossible, and transfers of personnel between autonomous regional administrations may not be easy to arrange with the result that personnel may become parochial in outlook. There can also be little systematic career planning in an organization that is very small and can only offer very limited prospects of promotion.

The management of state forests is usually centralized. In the case of major conservation forests, this is partly because most are of national or even international rather than of purely local importance and partly because the costs of managing such forests are generally borne by central government. In the case of state forest enterprises with economic objectives, size is important not only for achieving economies of scale but also for the promotion of forest industrial development, for example by the offer of guaranteed supplies of raw material to new forest industries.

2.2.3 Structures

The bodies responsible for forestry in the countries in Europe fall broadly into two categories: (1) government departments in a ministry; (2) boards, committees, commissions.

Either way, there is always a central office and there usually are regional and district offices or enterprises or "combinats". In some instances the central office has direct control over these other units, while in other countries, the regional and district units form part of the

general local administration. Furthermore, as already mentioned, where the forestry authority and forest enterprise functions are performed by different organizations, the forest enterprise tends to exercise more direct control throughout the country than the forestry authority. There are thus a very large number of possible variations in structure. A brief summary, country by country is given below.

Albania: The Directorate of Forests and Pastures is in the Ministry of Agriculture. The forestry enterprises operate in the 26 districts of the country. These enterprises deal with forest protection and management, hunting, hydrotechnical installations for protection against erosion, utilization of minor forest products. The Directorate of Wood and Paper is in the Ministry of Industry and Mines. In the 26 districts, there are three wood combines, six paper factories, three fibreboard factories and the enterprises that are concerned with harvesting and sawmilling.

Austria: The Federal Ministry of Agriculture and Forestry has a forestry department which acts as forestry authority and constitutes the highest level of forestry administration. The district forestry authorities are attached to the general district administrations and the provincial forestry departments are attached to the provincial governments.

The Austrian federal forests are managed by a federal enterprise which is directed by a board of three members who follow the directives of the Federal Minister of Agriculture and Forestry.

Belgium: Since the regionalization in 1983, there only remains a very small central unit of the Water and Forest Service in the Brussels Region which is attached to the Department of Natural Resources and the Environment.

The Flamande Region and the Wallonne Region each has a forestry service with a central office and a number of "inspections" which in turn are subdivided into "cantonnements", "brigades" and "triages forestiers".

Bulgaria: The management of forests is the responsibility of the Association of Forestry and Forest Industry (AFIF). The Department of Forestry at the Ministry of Agriculture deals with policy and provides a link between Government and the AFIF. At present, a study is in progress to consider a system of self-financing for districts where there is much production, while centralized financing would continue for districts with a preponderance of cultural operations (reforestation, erosion control, etc.).

Cyprus: The Department of Forests under the Ministry of Agriculture and Natural Resources is headed by a director and is divided into eight specialist and nine territorial divisions.

Czechoslovakia: The Ministries of Forest and Water Economy in the Czech Socialist Republic (CSR) and the Slovak Socialist Republic (SSR) control directly the state forest enterprises and other forestry organizations. Furthermore, each Ministry controls, within its territorial competence, the Research Institute of Forest Economy, the "Lesprojekt" (Institute of Engineering), the Enterprise of Technical Development and Staff Training. Individual enterprises, which average about 25,000 ha

constitute the basic organizational units which are subdivided into forest administrations of about 2500 ha and forest districts of 800 ha.

Denmark: As from January 1987, the National Forestry Service and the National Agency for the Protection of Nature, Monuments and Sites (both in the Ministry of the Environment) have been combined to form the National Forest and Nature Service. It consists of a headquarters employing 258 persons and of 33 districts. The heads of the forest districts (Skovridere) have considerable freedom of action within the limits set by the working plans for the state forests and by the regulations applicable to the private forests. As already mentioned, the Ministry of Agriculture continues to be responsible for financial and technical support of private forestry, forest research and vocational and technical training in forestry.

Finland: The National Board of Forestry (NBF) is a Government central agency under the Ministry of Agriculture and Forestry. The duties of the NBF include the development and supervision of forestry in the country as well as the management of the state owned forests. For the management of the state forests the NBF has a countrywide field organization divided into three regions, each with several districts. The organization of private forestry comprises two Central Forestry Boards, nineteen District Forestry Boards and a large number of forest management organizations. The duties of the Central Forestry Boards are twofold: to ensure the observance of the law concerning private forests and to promote private forestry at national level. The Central and District Forestry Boards are partially self-governing bodies consisting of representatives of forest owners, forest industry companies and forest workers.

France: At national level, The Directorate of Forests which comes under the Minister of Agriculture has a staff of 80 persons and is responsible for all matters relating to forestry policy and general forest administration, including the granting of financial incentives, the development of markets, tutelage of the "Office National des Forêts" (ONF) which manages the state forests, and the harmonization of the financing and development of the regional offices of forest ownership. Under the administrative decentralization introduced in 1982, the Directorate of Forests influences and controls forestry activities via the Prefects and Regional or Departmental Commissioners of the Republic who carry the sole responsibility for the decentralized services of the state. This system is said to make it difficult to get things done on time.

The ONF is financially autonomous and manages the state forests on commercial lines. It also supervises management and sales in the forests of the communes. Seventeen Regional Centres of Forest Property are responsible for promoting the productivity and improving the structures of private forests.

German Democratic Republic: The administrative structure of forestry is as follows:-

- 1 Ministry of Agriculture, Forestry and Food Industry with the Main Division of Forestry,

- 14 Regional Councils with a forestry division each,
- 77 State forest enterprises which average 31,200 ha and are subdivided in turn into 407 forest districts and 2197 forest ranges.

The State forest enterprises manage forests owned by cooperatives and also some of the private forests on a contractual basis. The Church has its own personnel to manage the 35,000 ha of forests which it owns.

Federal Republic of Germany: The Federal Forestry Service under the Federal Ministry of Food, Agriculture and Forestry is concerned mainly with general forestry policy, legislation, certain measures in support of private forestry, and external relations, but it exercises little, if any, influence over forest administration in the 11 states (Länder) each of which has its own forestry service (usually in the Ministry responsible for Agriculture) which manages the forests belonging to the State (Land) and acts as forestry authority for all forests in other ownership. For historic reasons, the organization of these forestry services varies from Land to Land.

Greece: The Forestry Service under the Minister of Agriculture is decentralized. The central office consists of ten functional divisions each of which is subdivided into three or four sections. All operational activities come under seven regional inspectorates of forests, each divided into divisions, districts etc. In addition, there are three separate divisions for the planning and execution of reforestation projects in Attica, Thessaloniki and Rodapi.

Hungary: The organization has changed several times during the past 40 years. Since 1979 the Office of Forestry and Forest Industries has been in the Ministry of Agriculture and Food; it is responsible for the administration of forestry, primary wood processing and timber trade as well as game management. It also coordinates the sector's activities with other sectors of the economy in the field of environmental protection and nature conservation. The state forest inspectorates under the Office of Forestry and Forest Industry supervise the forest owners' management plans and operations.

The organization and activity of state forest enterprises is built on the principle of vertical integration: they deal with wood growing, logging, processing and sometimes also with furniture production and marketing. Directors of enterprises are elected for five years by the Board of the enterprise through secret ballot.

Ireland: Forestry has recently been transferred to the Ministry of Energy and is being reorganized. The major change is the separation of the forestry authority functions from the management of the state forest enterprise which is to receive some autonomy and will be managed on commercial lines.

Israel: The Forestry Department, headed by a Director, is part of the autonomous Land Development Authority and is responsible for the management of all state forests (98% of total forest area). The central office controls four territorial divisions. These are subdivided into

districts which in turn are subdivided into ranges.

Italy: The Regions now have their own forestry services and they also make use of the personnel of the "Corpo Forestale dello Stato" (State Forestry Corps, whose main duty is to protect forests), which is put at their disposal by the Central Administration under bilateral agreements. About 400,000 ha of state forests were excluded from the regionalization and are managed autonomously with separate budgets by the State Forest Enterprise.

Luxembour: The Administration of Water Resources and Forests which comes under the Ministry of the Environment acts as forestry authority and also manages the state forests and forests belonging to communes and other public bodies.

Netherlands: The governmental responsibilities for public and private forests rest with the Ministry of Agriculture and Fisheries in which the National Forestry Service has the task of implementing policy; it operates at national, provincial and regional level. The organizational structure of the Forestry Service is such that a strict division is maintained between the policy which applies to the entire forestry sector and the management of the state forests; this division also applies at provincial and regional levels. The Ministry of Economic Affairs is politically responsible for matters which involve the handling and processing of timber.

Norway: The Department of Forestry under the Ministry of Agriculture is directly responsible for matters concerning private forestry. Publicly owned forests are managed by the Directorate of State Forests and Land which is linked to the Ministry but has a certain autonomy. The part of the Public Forestry Administration dealing with private forestry consists of three levels: at national level there is the Department of Forestry; each of the 19 counties has a County Land Board and a corresponding County Forestry Service; at local level, over 400 Municipal Land Boards are served by 184 units of the District Forestry Service. The Directorate of State Forests is the executing agency for forests belonging to various Ministries: Agriculture, Church and Education, Environment and Defence.

Poland: The Minister of Agriculture, Forestry and Food Economy exercises his forestry functions mainly through the Director General of State Forests, directors and chiefs of forest districts of state forest enterprises, and directors of national parks. The regional forestry administration is also concerned with the supervision of forests which are not owned by the state. The Director General is personally responsible for the state forests. He is also the chairman of the Forestry Board which has both decision making and advisory duties. In addition to the Director General, the Board comprises the Deputy Director General, the Controller of Finance, the Inspector General of Forests and directors of the regional offices of the state forests.

Portuga: The forestry sector consists of a number of interdependent elements which, according to the Country Report, should be, but are not, treated as a coherent whole. The Directorate General of Forestry in the Ministry of Agriculture, Fisheries and Food is charged with contributing

to the formulation and implementation of forestry policy; managing state lands for forestry, forest grazing, wildlife, fresh water fisheries and bee keeping; and supporting the management of these resources on other land. The Director General is assisted by two bodies: the Forestry Council which is consultative and consists of senior officials and representatives of various activities connected with forestry; and the Administrative Council which deals with the finances of the Service. Apart from the central services, the Directorate General disposes of seven regional offices. Regional Coordinating Committees and other relevant bodies also participate in regional forestry planning.

Spain: Since decentralization between 1980 and 1985, the Autonomous Communities are generally responsible for all aspects of forest management, harvesting, afforestation, hunting, etc. The Central Administration has retained the responsibility for basic legislation, coordination of general planning, public works affecting more than one Autonomous Community, international relations, statistics, national forest inventory and management of national parks. Several organs under the Ministry of Agriculture are concerned: The main organ is the "Instituto Nacional para la Conservacion de la Naturaleza" (ICONA) which is an autonomous body charged with implementing conservation programmes. Forestry research and training come under the Directorate General of Agricultural Research and Training; grants to private forest owners are administered by the Directorate General of Agricultural Production; and the Directorate General for Agro-Industries is responsible for the primary wood processing industries.

Sweden: The National Board of Forestry is a central administrative authority under the jurisdiction of the Ministry of Agriculture; it is charged with the implementation of the forestry policy established by the Government and Parliament. The work of the National Board of Forestry is carried out with the help of 24 County Forestry Boards, one in each of the 24 provinces. Normally, the provincial governor is chairman of the board, the members of which are selected from amongst local politicians and forestry professionals. The County Forestry Boards carry out activities which are financed from public funds, but they also provide contractual services on a commercial basis. The County Forestry Boards have a central organization and a district organization. Almost all contacts with individual forest owners are directed from the forestry districts which are the core of the national forestry organization.

The National Forest Enterprise of Sweden (Domanverket) which manages the state forests comes under the Ministry of Industry. It works on a commercial basis like a private company, but it is also responsible for state forests which are reserved for conservation e.g. national parks.

Switzerland: Since 1986, the Federal Forestry Service in the Ministry of the Interior has also been given the task of protecting the countryside; it is now subdivided into a division concerned with forest conservation and hunting, and another that is concerned with the protection of the countryside and its use for recreational purposes. The implementation of policies lies mainly with the Cantons, where the forestry organization generally operates at three levels: the inspectorate of forests under the head of department responsible (that may

vary from Canton to Canton), regional offices to ensure territorial coverage, and the forestry districts which constitute the operational units. The framework of this organization is fixed by Federal law.

Turkey: The General Directorate of Forestry in the Ministry of Agriculture, Forestry and Rural Affairs is responsible for protecting and managing almost all the forests in the country; its other duties include: afforestation, managing national parks, natural monuments and recreational areas; dealing with forest cadastral and ownership problems; construction and maintenance of forest roads; planning and research; preparing annual work plans for forest villages in cooperation with the General Directorate of Organization and Support. The field organization consists of 24 regional forest conservancies, 207 forest enterprises which work under the conservancies, and sub-units of these enterprises.

Yugoslavia: Under the Yugoslav self-management system, the degree of decentralization in the forestry and wood processing industry is complete. Federal organs have retained only certain competences stipulated by the constitution. Forests are managed not only by "collectives" in charge of public forests or by private forest owners, but also to a certain degree by society through its competent organs in the Federation, Republics, Provinces and Communes. Wood processing and the pulp and paper industries are in the competence of the Federal Committee for Energy and Industry at Federal level, and of committees or secretariats for industry in general in the republics and provinces.

UK: The UK has two forestry services: the Forestry Commission in Great Britain (England, Scotland, Wales) and the Forestry Service in Northern Ireland. The Forestry Commission is governed by a board of Commissioners with ten members, four full-time and six part-time, under a part-time Chairman. There is a three-tier administrative organization: headquarters (in Edinburgh, not in the national capital London), seven Conservancies and 69 Forest Districts. The administrative subdivision of districts into "forests" was abolished a few years ago in order to streamline management. The Forestry Commission is both Forestry Authority and State Forest Enterprise.

The Forestry Service in Northern Ireland is a division of the Department of Agriculture for Northern Ireland; apart from a few exceptions, it has similar responsibilities to the Forestry Commission in Britain; in size and structure it corresponds to about one British Conservancy.

USSR: As already mentioned, the supreme state organization is the State Committee for Forestry (GOSLESHOZ) and in the Republics and Autonomous Regions there are either Ministries or State Committees for Forestry. In the regional and provincial administrations there are units for forest management. The basic management unit is the woodlot (Leshoz). At local level, the organization of forest management varies according to the importance and the size of the forests. In regions with small forest resources, one organizational unit is in charge of forest protection, management, export and wood processing industry. The establishment of more such units is considered to be the main task in the process of

modernising the forestry sector in the USSR. The main State Organization for the wood industry is the Ministry of Wood, Pulp and Paper Industry.

Comments on structures: The Country Reports are sparing with comments on systems of forestry organization. Some general conclusions seem warranted, nevertheless.

(1) Except perhaps in very small countries, the vesting of the responsibility for forestry, and more particularly for the management of state forests, in a board (or committee or commission) seems to have considerable advantages over giving the responsibility to a conventional government department. The board structure

- ensures a modicum of administrative independence which is essential to efficient management;
- facilitates integration of forestry into the general economy by the presence on the Board of persons with experience of relevant sectors of public life;
- injects valuable outside expertise into forestry.

The membership of the Board must, of course, be well chosen and there must be a chief executive with adequate authority to implement the Board's decisions.

(2) Some countries have gone much further than others in taking advantage of better communications and other modern technology to streamline their forestry administration by reducing the number of tiers of management (provinces, districts etc.) and thus increasing the size of individual units. There is of course also the converse danger of going too far in streamlining and thus prejudicing indispensable contacts between forestry officers and local populations.

(3) Major changes in structure, especially through devolution, are bound to create temporary difficulties, which can be reduced by forethought and by giving weight to administrative as well as to political considerations. The general impression is that forestry often benefits more from improvements to existing structures than from major reorganizations imposed from outside.

(4) The advisability of extending the responsibilities of a forestry administration outside the forest (e.g. pastures in Bulgaria, countryside conservation in Switzerland, hunting in a number of countries) or conversely the inclusion of forestry in a broader organization (as in Denmark) depends on local circumstances, and no general comment is possible.

2.3. Legislation

2.3.1. General aspects

The legislation reported by the countries falls into two broad categories: (i) general legislation with implications for forestry; (ii) specific forestry legislation.

The relevant general legislation embraces a wide spectrum of topics including: land use, employment, plant health, transport, trade, taxation

and environmental issues. While much of this general legislation does not impinge directly on forestry policy, there are notable exceptions. Thus the banning of environmentally unacceptable chemicals for pest control or as herbicides has forced forestry services to seek alternatives; and the imposition of strict emission standards, especially in Sweden, has forced the pulp industry to modify its methods. Conversely, the absence of such legislation elsewhere is contributing to forest decline and has prompted Austria to complain: "The greatest legal and political limitations of forestry policy are inevitable whenever interests other than forestry prevail. For instance, an immediate solution to the problem of air pollution - the most serious problem of our time - could not be found because of the conflict of interests with trade and industry."

As forestry generally carries little weight in national policies, it is only in exceptional circumstances - the pollution issue is a case in point - that general legislation is introduced for the sake of forestry. What may be generally less difficult to achieve are modifcations to, or special provisions for, forestry in general legislation. Whatever happens, there must be no contradiction between forestry policy and legislation: otherwise either the one or the other will be frustrated, as has happened when policies of afforestation have been hampered by out of date restrictions on the conversion of agricultural land to other use.

2.3.2. Forestry legislation

Forestry laws in Europe are generally in support of three broad objectives: (i)protecting the forest and the environment; (ii)promoting good management; (iii) defining the rights and obligations of forest owners, the state and the public.

In some countries, these or similar objectives are written into the basic forestry act or code. For example:

Poland (Act of 20 Dec. 1949 on the state forest economy): "the state economy should strive to execute the following tasks on the basis of the instructions contained in the national economic plan:

- maintain the permanence and continuity of the production of wood and forest by-products in order to satisfy the present and future needs of the national economy;

- increase the national productivity of the forest;

- ensure favourable impacts of forests on the country's climate, water management and national culture."

Switzerland (objectives as set out in new draft forestry law):

- "the maintenance of the area under forest and its regional distribution;

- the protection of the forest as an aggregate of eco-systems and as a safeguard of the landscape against damage by natural causes and by man;

- the maintenance and development of all the functions of the forest, especially its protective function for the population and its function

to produce wood;

- the maintenance of sustained management of forests which are stable, diverse and protective;

- the promotion of a viable forest economy."

Among the problems encountered by Switzerland in drafting basic forestry legislation are the following two:

- finding a legal definition of forest cover, in view of the dynamic evolution of natural vegetation;

- the need for a clear distinction between compensation paid to forest owners for services rendered in the public interest and financial aid given to the owners to ease their financial difficulties.

The problem of finding the correct balance between public and private interest is usually best solved by wide prior consultation with all parties involved.

There are several tiers of legally binding measures. Hungary, for example, reports the following:

- laws enacted by Parliament;
- law decrees approved by the Presidential Council;
- government decrees or decisions endorsed by the Cabinet;
- ministerial order, signed by a member of the Cabinet.

In some countries, e.g. Spain and Switzerland, the most fundamental and unchanging aspects of forestry policy (e.g. the permanence of the forest estate) are anchored in the topmost tier of all, namely in the country's constitution.

Having more than one tier of legislation facilitates the application of basic principles to local conditions. Thus in federations such as FRG, Switzerland and the USSR, laws enacted by the central government sometimes serve as the framework for more detailed legislation by the regional governments. Also in countries with no federal structure, general laws are sometimes passed which authorize one or more nominated authorities to enact subordinate regulations or by-laws e.g. in connection with facilities for forest recreation in a particular locality.

Some countries have reported the consolidation of their forestry legislation in a forestry act or code. The assembly of all forestry laws in a single document is a great convenience to all who are concerned with the implementation and enforcement of forestry policies and laws. Consolidation also provides a good opportunity to detect gaps in legislation and to abolish or modify laws which are no longer relevant as they stand, either because they are old or predate the establishment of the state. France and Israel provide examples.

France: "Most previous legislation dating as far back as 1827 was consolidated in the Forestry Code of 1979 and there has been some additional legislation since then."

Israel: "Forest legislation is still based on the Ordinance for the Protection of Forests and Management of Forest Reserves from 1926" - that is 22 years before the State of Israel came into being in 1948.

Portugal is among the countries where consolidation has not yet proved possible but the need is recognized: "No forestry policy is applied without legislation, but the problem is that there are many laws and there is need for codification and modernization."

In forestry, as in other walks of life, some countries have much more detailed laws and regulations than others which prefer to leave a greater margin of discretion to their administrators as well as to owners and timber merchants (e.g. on methods of measurement and trade practices). The inclusion of detail ensures equality before the law, but complicates enforcement and may result in the need for frequent revisions, if the law is to be kept abreast of changing conditions. Greater freedom on the other hand, gives more scope for deciding particular issues on their merits, but may result in similar cases being handled differently. As already mentioned, regulations are easier to revise than laws.

On the question of forest law enforcement, some governments (e.g. France, FRG) invest personnel of the forestry authority with certain police functions, including the power of arrest, in which case the officials concerned normally wear uniform to facilitate identification. Elsewhere (e.g. UK) officials have no such powers and have to report contraventions to the police for action. The two systems reveal a significant difference in the national perception of the role of the forestry authority and its staff.

2.3.3. Conclusions

The great diversity of the legal systems in Europe permits only of a few general conclusions. Although obvious, these conclusions are listed below because experience indicates that they are not always acted upon.

(1) National legislation and forestry policy must be compatible with one another. Any divergencies must be rectified by adjusting the one or the other or both.

(2) The drafting of forestry legislation calls for forestry expertise as well as for legal expertise and, therefore, requires close collaboration between the legal and forestry services of the state.

(3) Forest laws should be drafted, as far as possible, in simple language that is readily understood by all concerned; where this cannot be done, it is useful to add a summary in plain language, which outlines the intention of the legislation.

(4) Forestry legislation should be codified and the code periodically updated.

(5) No legislation should be introduced which cannot be enforced; otherwise the respect for law is undermined.

3. FINANCE

3.1 General

Most countries have reported only in very general terms on the financial and economic aspects of forestry policy except to point out that forestry's contributions to national budgets and gross domestic products are modest, usually less than 1% and rarely much more, even in countries with large forest resources. Forest industries also make a modest but usually somewhat greater contribution. The environmental and social contributions of the forestry sector to national life cannot readily be expressed in money terms but are widely regarded as more important than the economic contribution, especially by countries with many mountains or an unevenly distributed rainfall.

The main impression that emerges is that most countries would do well to review the financial and economic aspects of forestry policy in order to render forestry more profitable and to strengthen the case for forestry at political level. Forestry has been most successful in the few countries where the forestry authorities and the state forest enterprises have introduced effective systems of budgetary and financial control and of project evaluation and where the forestry profession is geared to this approach. The social and environmental benefits of forestry, which are difficult or even impossible to quantify must, of course, be taken into account; they complicate the issue, but do not preclude a rational scrutiny of options.

Sweden alone has presented a very detailed forecast up to the second half of the 21st century of the physical and financial consequences of several policy options. While such a forecast may seem to be very ambitious, it at least provides a standard by which to measure future achievement and by which to assess the need for policy modifications. Countries which have not undertaken such forecasts might do well to examine the advisability of attempting such an exercise.

Three main sources of funding for forestry have been reported. The most common source are general state funds via the annual budget. Most forestry authority expenditure is met in this way. State forest enterprises normally have a degree of financial autonomy; in enterprises where annual income exceeds expenditure, part of the surplus is surrendered to the state as tax or in some other way; deficits on the other hand (which are inevitable when most of the plantations are still young as in the UK) are financed by credits or grants.

A few countries resort to levies as a third source of finance; in the case of France, Italy and Norway they are raised on the sale of produce at a rate of between 0.5% and 3% of the sale price; in Sweden, a levy of 0.8% is raised on the taxation value of forest property. The levies are used to finance silvicultural operations - planting, tending, road-building, etc. In Norway, where the levy is collected and spent in the same locality, the system is said to be popular; in Sweden, on the other hand, where most of the levy is collected in the south, but spent in the north, views are divided. France and Italy have not commented. Some countries, such as the UK object to levies because they regard it as wrong in principle that tax revenue (and levies are a form of tax) which is derived

from a particular source should be set aside for a particular purpose.

In countries with a federal structure, the central government usually participates in the financing of forestry measures by the allocation of funds to the local governments as well as by the direct financing of activities under its direct control (e.g. maintenance of national forest parks, or the administration of incentives which are uniform throughout the national territory).

The following examples illustrate particulars of some of the financing procedures:-

Bulgaria: "Forestry is financed via the budget out of the income from the sale of forest produce, hunting and various other accessory activities. At present a study is in progress to consider a system of self financing for districts where there is much production while the present system of central financing would continue for districts with a preponderance of cultural operations (reforestation, erosion control measures, etc.)."

GDR: "Forest State enterprises are financed by the self-generation of resources from the sale of timber. Investments can be financed by bank credits. The rate of interest for investment credits amounts in general to 5%."

FRG: "The Federal Forest Act provides for the Federal Government to take a share in the financial support of forestry. ... The procedure is mainly as follows:- The farm ministers of the Lander deliberate each year, under the Federal Minister of Food, Agriculture and Forestry, on the concepts of the Federal Government and the Lander with regard to the measures to be promoted in the agricultural sector, including forestry".

Switzerland: "The approval of federal support for forestry is made dependent upon a contribution from the cantons which is commensurate with their financial resources."

Limitation of funds is cited as the main constraint on the implementation of forestry policy by Cyprus and the FRG, while discrepancies between forestry policies and monetary and fiscal policies are referred to by Denmark and Sweden. Austria has pointed out the difficulty that arises from the fact that the state forests carry out their management as an independent economic body but are incorporated in the annual federal budget. By contrast, Albania reports:- "The Development Plan for Forestry provides for the financial resources required for implementation. .... There are thus no obstacles to the implementation of forestry policy." The above examples illustrate prevailing contrasts.

The only conclusions about the general funding of forestry are obvious ones:-

(1) Any discrepancies between forestry policy on the one hand and monetary and fiscal policies on the other hand should be eradicated.

(2) This eradication is facilitated where forestry requires no subsidies.

(3) Erratic fluctuations in funding should be avoided because they cause waste; for example, an afforestation programme requires the raising of nursery stock a few years in advance of planting.

3.2. Taxes and tax concessions

3.2.1. General considerations

Taxes are rarely drafted with forestry in mind because they usually apply to the economy as a whole or to a large part of it. Concessions for forestry in general taxation are granted in recognition of the special characteristics of forestry and as an incentive to forest owners to act in line with forestry policy. Tax concessions have sometimes proved to be very effective; in the UK, for example, they have brought about the afforestation of over half a million ha. Tax concessions are, however, a much blunter instrument of policy than direct assistance in cash or kind. There are several reasons:-

(1) The value to the forest owner depends on his or her general tax position; thus the ability to set expenditure on afforestation against income from other sources is worth next to nothing to a forest owner who has little income from other sources, but it is worth a lot to someone whose marginal rate of income tax is 60%.

(2) The value changes with each change in the general level of tax. Thus the value of a 50% concession on inheritance tax is halved if the rate of inheritance tax on a given amount of capital is halved.

(3) Unlike direct assistance in cash or kind, tax concessions cannot easily be directed to specific purposes - particular sites, species, forestry operations, etc.; moreover, being specific to forestry, direct assistance can generally be varied more easily than taxes, but too frequent changes must be avoided if confidence is not to be undermined.

For the above reasons, tax concessions tend to be less cost-effective than direct assistance. Comparisons are, however, rendered difficult by the fact that the cost of tax concessions cannot be readily determined since that cost is inextricably linked to the individual tax situation of each forest owner. Because of their differential impact, tax concessions have also been criticized as being weighted in favour of the rich.

Needless to say, all interests are best served if taxes, tax concessions and direct assistance to growers are properly co-ordinated within the context of a coherent forestry policy.

No country has claimed to have an ideal tax system which is fair, simple, easy and inexpensive to administer, fiscally neutral and an incentive to good forest management. The reasons are not far to seek. In the first place, these objectives are difficult to reconcile with one another, especially fairness with simplicity. Then there are the specific problems associated with trying to fit forestry into the general tax

system of a country, namely:

- it is difficult to distinguish between current income and expenditure on the one hand, and changes in capital on the other (growing stock);

- the production cycle is long;

- annual turnover is very low in relation to the capital employed;

- while the costs are borne by the owner, the benefits some of which are difficult to quantify in money terms may accrue to a wider section of the community.

National comments on difficulties encountered include the following:-

- "The tax system is extremely complex. During the course of the last decades, fiscal and organizational - political requirements have resulted in an increase in the number of criteria, of which there are currently seventy" (Austria).

- "The fiscal measures may tempt owners to neglect good forestry and resort to ruthless exploitation" (Denmark).

- "The forestry taxation system is sometimes strongly criticized ...." (Finland).

- "The taxation system is very unsuitable: it leads to delays in felling mature trees and in thinnings" (Luxembourg).

- "One cannot say that forestry policy and fiscal policy are incompatible, but it is true that forestry problems could be handled with greater sensitivity, bearing in mind the non-economic benefits of forests. There is a case for reducing some taxes and abolishing others" (Spain).

- "It has been accepted that some further amendments concerning financial regulations have to be made" (Turkey).

Relatively few countries seem to have succeeded in developing a system of forestry taxation which is reasonably satisfactory. The problem is easier where forest holdings are large, and Bulgaria where all forests are owned by the state, is able to report; "Taxation policy is designed to facilitate forestry operations. All proceeds from sales are credited to a fund for silvicultural measures".

Taxes of relevance to forestry policy consist mainly of:

- taxes on income,
- taxes on capital.

Value added tax and various charges such as employers' contributions to social security systems, which affect forestry only in particular circumstances, will not be considered further in the present context.

3.2.2 Income taxes

The question of income tax is handled in four main ways:

- income assessed on the net income from forestry operations;
- potential income assessed on the basis of site quality, species etc.;
- tax on each cubic metre of wood removed from the forest or on sales on the basis of a standard price list;
- forestry exempted from income tax.

Within the above systems, there are again variants: in fact, no two countries have an identical system. Income taxes affect mostly forests in private ownership but also state forests may have to pay. Thus, in Hungary, state forest enterprises pay 40% of the profits to the budget. In Poland too, state forest enterprises are subject to the turnover and income taxes generally applied in the economy.

Using actual net income as the basis of income tax assessment is intended to bring forestry into line with other economic activities. Where this system is applied, it is usual to allow the cost of all forestry operations to be set against income. In Luxembourg, however, where only the cost of harvesting is allowed to be treated in this way, the understandable consequence has been a neglect of the silvicultural operations which are not tax deductible. In order to reduce the effects of annual fluctuations, the average net income over a period of years (e.g. 5 years in Norway) is taken as the basis of assessment. Abnormally high income resulting from timber sales after storm damage and other calamities is treated either as capital withdrawal and exempted from income tax (e.g. Denmark) or subjected to a reduced rate of tax. In some countries, income from forestry is aggregated with income from other sources; elsewhere, it is treated independently. Aggregation is an incentive to afforestation since it enables the cost of establishing a plantation to be set against income from other sources, but aggregation adds to the burden of income tax in a forest which produces a net income.

Assessment on the basis of potential income saves much record keeping and accounting and is intended to stimulate good management by virtue of the fact that the tax will be the same whatever the income, but the system results in rough justice if income is low for reasons beyond the owner's control. To counteract this to some extent, stands below a certain age are generally exempted from income tax (e.g. Finland, Poland). The system also presupposes the existence of adequate data on yield potential on different sites and for different species as well as data on relevant local costs and prices.

Income tax in the form of a sales tax is levied in Greece. When a felling licence is granted, the produce is measured and priced in accordance with a standard price list which is updated annually. The sales taxes on certain forestry products in Portugal are taxes on processing rather than on forestry. In Israel, a tax is levied on each cubic metre of wood removed from the forest.

Forestry is exempted from income tax in Ireland, Netherlands, Yugoslavia and, since 1988, the UK.

3.2.3. Capital taxes

The main capital taxes which are applied to forestry are: (i) inheritance and capital transfer taxes, (ii) property or land taxes, and (iii) capital gains tax.

Transfer of forest property by gift or inheritance is taxed in nearly all countries with private forest ownership. As the high rates of taxation applied in some countries could lead to an undesirable splitting up of forest properties into unviable small units, special concessions for forest property are the rule. The three main concessions to be found are:

- low capital valuation (e.g. FRG, Finland),
- assessment of tax at a reduced rate (e.g. Luxembourg), and
- payment by instalments (e.g. Belgium) or deferment of payment until timber is harvested at maturity (e.g. UK).

Forestry also benefits from the general tax provisions in some countries, whereby the rate of inheritance tax is greatly reduced for transfers between close relatives. For transfers by sale, some countries impose a modest land registration tax (e.g. Italy) or a conveyancing tax (e.g. Netherlands).

Any annual taxes on the capital value of land and other property are generally levied on forests as on agricultural property. Such taxes are not necessarily confined to privately owned forests: in the GDR, for example, the state forests have to pay 4 DDR marks real estate tax per ha per year. Provided that such capital taxes are very low, as they usually are, they present no special problem. A very modest wealth tax, at a level lower than net forest income after other taxes, may be regarded as a surtax on income and may also cause no serious problem but, if the above taxes are at rates which bring about the gradual breaking up of forest estates into unviable small units, forestry policy is frustrated.

A capital gains tax raises the problem of distinguishing between income and capital growth and is applied only in a limited number of countries. In the UK, the problem of distinguishing between income and capital growth is avoided by levying capital gains tax only on the value of the land, but not on the growing stock.

3.2.3. Possible improvements to forestry taxation

There appears to be a strong case for most countries to review their systems of forestry taxation with a view to:

- simplifying some taxes and abolishing others; the objective would not necessarily be to reduce total tax revenue (although that too might be desirable in some instances), but to reduce the cost and effort involved in preparing tax returns and administering the tax system; in some instances lower taxes could be offset by lower cash incentives;

- eliminating or reducing disincentives to good management.

Measures which have already proved successful in a few countries deserve to be considered by others it being understood that different local circumstances may call for different solutions. Specific points that should be considered are:-

(1) The abolition of taxes which yield little revenue in relation to the cost of administration; several examples of this have been reported (e.g. a certain tax reduction of 95% - why not in that case a 100% reduction?).

(2) An increase in tax-free limits; many countries already have exemptions for very small properties, but there may be a case for raising these limits.

(3) Complete abolition of income tax for forestry as in Ireland, the Netherlands, Yugoslavia and the UK; this would probably only be practicable in other countries where the amount of revenue lost would not be great.

(4) Where income tax is based on current income and expenditure, it may be worth following the example of the countries which use 3 or 5 year running averages in order to enable management to be flexible.

(5) Inheritance and gift taxes as well as the concessions granted in respect of these taxes may encourage either premature or delayed fellings depending on circumstances. Some countries have sought to counter this tendency by imposing various restrictions, for example, that concessions only apply if the owner making the transfer has held the property for a certain number of years, and if the new owner keeps it for a further minimum period. Felling limitations shortly before and after transfers are another example of measures that have been found useful and might be considered elsewhere.

3.3 Direct aid to forest owners

3.3.1. Purpose and scope

The reasons adduced for giving aid to forest owners are:-

- as an incentive to adopt measures in support of forestry policy; this tends to be the most important reason;

- as compensation paid for compulsory services rendered in the public interest; here there is some divergence of opinion on the question to what extent such services are a responsibility connected with ownership and should therefore be rendered free of charge (e.g. avoidance of clear fellings on steep slopes to prevent erosion);

- to ease financial difficulties. (e.g. after storm damage or other catastrophe);

- to prevent the state forests, where they are subsidized, from having an unfair competitive advantage over forests in other ownership.

The question of types and levels of assistance has been approached in various ways. The most usual solution, which is probably also the simplest and best is to consult with the interests involved and then to proceed by trial and error, since it is usually impossible to predict the level of assistance needed in order to achieve the desired result. The Country Reports make little reference to the internal policy discussions which occur about incentives, but it is known that incentives can be a controversial issue. The assistance given falls into three broad categories:

- cash grants and low interst loans,
- assistance in kind (supply of free plants, etc.),
- advisory services and other forms of technical assistance such as training courses.

The purposes for which assistance is given vary considerably from country to country and include one or more of the following:

- afforestation of non-forest land;
- replanting after felling;
- planting trees outside the forest;
- various silvicultural measures: thinning, pruning, drainage, etc.;
- construction of forest roads and tracks;
- haulage and handling of timber including the procurement of harvesting and other equipment;
- protection against fire, disease, game, erosion, avalanches etc.
- contribution to fire insurance;
- making good the damage from major calamaties;
- formation of forestry groupings (cooperations etc.);
- preparation of management plans;
- training courses at all levels;
- contribution to conservation measures;
- contribution to expenditure incurred in connection with the opening of forests for recreation;
- promotion of activities such as bee keeping, fishing and game management.

Assistance is financed out of general government funds or out of the proceeds of the special taxes or levies mentioned above.

3.3.2. Specific considerations

Some incentives are calculated as a percentage of the actual expenditure incurred by the owner, subject to a specified maximum; others are paid as a fixed sum, e.g. per ha planted (UK) or length of forest road opened to the public (Netherlands). Fixed amounts facilitate budgeting, reduce the need for records, and favour those whose costs are low. In some instances, incentives are restricted to particular classes of ownership, e.g.:-

Austria: "Public forests are excluded from almost all types of promotion by the state budget while also being exempt from the taxation of profits. Direct financial subsidies are granted for forestry measures in forest enterprises not exceeding 400 ha. Larger forest enterprises may be granted cheap loans ... for the haulage and handling of timber."

Belgium: (Wallonne Region): "The communes and other public establishments receive subsidies ... for plantations ...., for tourist facilities ... and for forest roads. Aid to private forestry is confined to .... the first thinning in conifer stands, if certain detailed conditions are met."

Incentives in kind instead of in cash, have been found to be preferable in some circumstances and for certain purposes, but they may also lead to difficulties. For example, the free supply of plants for afforestation helps to ensure the use of suitable planting stock, but may also disrupt the legitimate trade of commercial nurseries where they exist. In this particular case, a solution that has been suggested is to use these commercial nurseries as contractors to raise the plants in question. A form of aid in kind which is particularly beneficial and almost universally welcome is sound, practical advice given to woodland owners by the staff of the government forestry authority. It also makes for better relations if the officials, who visit estates to monitor compliance with legislation or progress of grant-aided work, can at the same time help with constructive advice. In view of the interdependence of agriculture and forestry, those who give technical advice on forestry should have some knowledge of agriculture and vice versa. In an ideal world, they might be the same persons. However, forestry services should be careful not to duplicate competent commercial sources of advice where they are available.

Human nature being what it is, aid that is too easy to get is rarely appreciated and often wasted; and initial enthusiasms may wilt. All over Europe there are examples of tree planting schemes which have failed either through carelessness in the handling of plants at the time of planting or, more often, through lack of subsequent tending. In order to reduce these risks, the recipients of incentives in kind should normally be required to make an appropriate contribution in cash or labour, and there must be adequate monitoring of progress accompanied by measures which will sustain interest and improve knowledge such as courses, practical exercises, and competitions. Some countries, e.g. the UK, have found it useful to withhold part of the grants for afforestation until the plantation is properly established.

Because incentives are specific, they may conflict with other policies unless they are carefully formulated. Thus grants for afforestation have encouraged the planting of sites which were intended for preservation in their existing condition as habitats for rare species of wildlife or simply as open spaces with a beautiful view. Conversely, forestry has suffered through the granting of incentives for other purposes. In the EEC, for example, the agricultural subsidies which have led to a surplus

of some farm products have discouraged the afforestation of land which is marginal for farming but would be highly productive for the growing of timber, which the Community has to import in large quantities. Foresters can only hope for a sensible resolution of such conflicts of interest if they make their voice heard and, at the same time, display an understanding of the other interests involved.

A point that is sometimes overlooked is the impact of direct assistance and tax relief on land values. Thus increases in financial incentives tend to raise the market price of land while reductions tend to lower land prices.

The timber market, however, suffers little or no distortion from government assistance to forestry. This is due in the first place to the long period that usually elapses between the receipt of assistance and the sale of the timber, the price of which is determined by the market conditions at the time and not by the accummulated cost of production over many years. A second reason lies in the fact that so much value is added to the timber in transport and processing that the value of the standing tree in the forest, or even of the felled tree at the roadside usually constitutes only a modest proportion of the price paid by the consumer for the final product.

Incentives, whether in the form of tax relief, cash, cheap loans or supply of materials and services, can only be effective if the people they are intended to attract know about the incentives and can be persuaded that the incentives are worthwhile. That is why publicity is so important. Publications, lectures, field demonstrations all play a part, and the presentation must be geared to the intended target of the publicity. The sophisticated urban businessman needs a different type of presentation from the local farmer.

In every case, however, the presentation should be objective. Possible risks and disadvantages of a forestry investment should be pointed out as well as the advantages. Apart from ethical considerations, the inevitable disappointments which follow exaggerated expectations can do the cause of forestry much harm.

3.3.3. Independent financial and technical advice

The incentives mentioned so far are provided mainly by the government, but the private sector also has a role to play. While most potential private investors will be happy to accept the advice of the appropriate government services on technical matters, the more sophisticated investors may want independent advice on the financial implications of a forestry investment. In Britain, there are now a number of companies that provide such advice and in a few other countries there are banks which do so. This kind of service is usually part of a broader financial advisory service which also includes advice on general taxation.

Potential investors who do not wish to manage their plantations themselves may be persuaded to put their money into forestry if there are reliable companies or individuals who undertake the management for them. In Britain, most forest management, except on some old estates, is now carried out on this basis. In some instances, these companies also act as financial advisers to their clients; there is, however, a risk here of a conflict of interest, since a management company will want to do as much work as it can reasonably justify on technical grounds - 'doing the right thing by the forest' - while financial considerations may point to doing rather less. In some European countries, forestry cooperatives play an important part in providing management services. These cooperatives are formed by the woodland owners themselves. The experience with these cooperatives has been very varied. Some have been extremely successful, others have been dismal failures. The main precondition for success appears to be a very dedicated and competent manager.

As already mentioned, most potential investors go into forestry on a medium- to long-term basis, but unexpected circumstances may arise which call for disposal at short notice. Marketability of forest property has, therefore, proved to be an incentive, at any rate in Britain where a market for plantations has developed largely because of the activities of the forestry investment companies.

3.3.4. Support strategies

The single most important point to make is that the interests of all concerned with forestry are best served if the need for assistance of any kind is reduced to a minimum. However well founded the case for assistance may be, experience has shown that any form of assistance curtails independence - a point that private growers in particular should heed - and that the need for assistance, except for the protection of the environment, weakens the status of forestry at political level. Assistance for growing timber should, therefore, be concentrated mainly on measures which will improve economic performance and thus eventually render assistance superfluous. Grants for capital investments such as road construction and afforestation should, therefore, usually have priority over annual payments such as management grants.

Some countries are already in the fortunate position that their forestry is not tainted by the "begging bowl" image. Other countries, which usually through no fault of their own are less fortunate, might do well to review their strategies for forestry support with two broad aims in view:

(1) separation as far as practicable between support for timber production and service functions (conservation, recreation); and

(2) concentration of support for timber production on "pump priming"

measures, i.e. on measures which will make timber production self-sustaining; the incorporation of a timetable for phasing out support, while theoretically attractive, may, however, be impracticable as well as politically unwise.

4 FOREST MANAGEMENT AND PROTECTION

4.1. The place of forestry in land-use policies

The role of Europe's forests in land-use must be viewed in historic perspective to be understood. It was the clearing of forests for permanent farming and human settlement that heralded the dawn of civilization in Europe. As civilization progressed, the forests continued to recede and decline, because more land was needed for cultivation and settlement, more timber was needed for construction and ship-building, and more fuelwood was required not only for domestic purposes but also for industrial uses such as the burning of bricks, the smelting of metals and the refining of salt. The process of forest destruction and degredation was often accelerated by indiscriminate forest grazing; the goat was, and in some countries continues to be, particularly destructive.

It was only when shortages of timber and fuelwood began to be felt,that steps were taken to limit further forest clearance and to initiate sustainable yield management in the forests that were left. In some parts of Europe this stage was reached centuries ago; elsewhere, as in Britain and Ireland, forest destruction continued well into the 20th century.

Forests began again to expand as productivity in agriculture rose and less land was needed for farming. It was the poorest and most inaccessible farmland that was abandoned first; some of this was recolonized naturally by trees and some was reforested. The process continues. Until very recently it was universally assumed, and in most countries also explicitly stated as a matter of policy, that forestry should be confined to land not needed for farming i.e. forestry was confined to the poorer land. This policy has been called into question within the last few years as a result of the enormous and costly agricultural surpluses that are plaguing most of Western Europe. In the European Community alone it has been estimated that some 15 M ha will have to be taken out of food production if the surpluses and the associated subsidies of almost US$ 30 bn per year are to be brought under control. The impact of these various influences has differed from country to country and so has the timing of the policy response. The priority of agriculture over forestry continues to be emphasized by several countries e.g.:-

- **Albania:** there is a policy of reforesting deforested areas and unproductive forest land; there is no abandoned agricultural land - every village is inhabited.

- **Belgium:** afforestation of farmland requires special permission.

- **Hungary:** "one of the fundamental principles of Hungarian land use policy is the utilization for food production of all land that can be cultivated economically" - (this still leaves some 300,000 ha for afforestation: flood plains along rivers, etc.).

- **Ireland:** afforestation takes place on land that is marginal for agriculture.

- **Norway:** "as yet there are only limited restrictions on the conversion of forests to agriculture, but the afforestation of farmland requires special permission" (the situation is, however, being reviewed).

On the other hand, some countries place particular emphasis on maintaining the extent of the existing forest area by stipulating that any necessary forest clearance (e.g. for road construction) must be compensated by the afforestation of an equivalent area in the vicinity. Switzerland and Luxembourg are cases in point.

A policy of promoting the afforestation of highly productive agricultural land within overall forest area planning, which seeks to coordinate all relevant public interests, has been reported by Austria which intends to afforest 1800 ha of such land per year for an unspecified period; the objective is to grow biomass for energy as a means of saving fossil fuel. Sweden and a few other countries are considering similar measures.

On the question of afforesting some of the 15 M ha of farmland no longer needed for food production in the European Community, clear policies have been slow to emerge, but the views of the forestry service in the French Ministry of Agriculture as expressed in the French Country Report echo the cautious recommendation of the Geneva Declaration and appear to be widely shared:

- "afforestation is no panacea; the technical difficulties are great;
- to start with, the emphasis must be placed on arousing the interest of farmers in their forests and in forest work as a means to complement their earnings;
- given the limited financial resources at the disposal of forestry, priority must be accorded to the improved management and productivity of the existing forest;
- a separate policy of afforesting agricultural land could be introduced, provided that
  - . the farmers want to afforest and receive the necessary financial assistance,
  - . the action is properly phased, is in accordance with sound land use, and results in forestry units large enough to be managed economically,
  - . the afforestation is planned separately for each region and placed within the framework of the regional forestry guidelines,
  - . the afforestation is accompanied by the necessary investment in wood processing industries."

The above views reflect the fear of many foresters in the EEC that afforestation of surplus agricultural land may merely be used as a

convenient tool to solve agricultural problems with scant, if any, regard for the interests of forestry. The fear is fuelled by recent EEC and national proposals to encourage the afforestation of parts of farms, but not of whole farms, even where elderly farmers wish to give up farming; such proposals could aggravate the already existing uneconomic fragmentation of forest holdings.

Almost all countries in Europe have afforested considerable areas in recent decades and many countries have programmes to continue this work as well as to improve existing forests. By far the biggest programme is that of the USSR which reports that restoration operations will be carried out on about 10 million ha, over half of which are concerned with sowing and planting trees. An increase in timber production is a principal objective in most cases although watershed management and other environmental objectives are given priority especially in mountainous regions. The recognition that demand for forest products may rise more slowly than had previously been expected does not yet appear to be reflected in afforestation policies.

The perception of the place of forestry in land use has changed not only because of timber deficits and the decrease in the amount of land required for agriculture, but also because of the growing recognition that resource management must include nature conservation if this planet is to be a fit place for future generations to live in. The recognition has also meant that foresters are no longer the sole arbiters on the environmental and conservational aspects of forestry policy. The Country Reports refer to the ministries and other official bodies, other than the forest administrations, which are involved with environmental aspects of forestry, but little is said about the problems which are known to have arisen in some instances when the responsibility for land use decisions is divided. To sum up:

- clear land use policies appear to be the exception rather than the rule;

- some of the existing policies do not take into account the implications of agricultural surpluses on the one hand and of a likely slowing down in demand increases for forest products on the other hand;

- the still widely held assumption that forests should be confined to land not good enough for farming has been found to be invalid by the very few countries that have taken the trouble to re-examine the issue in the light of present day conditions.

4.2 Management

4.2.1 Economics

An ominously sombre note is struck in the Swiss Country Report which states that income from forests no longer suffices to cover the cost of management, so that forests will only be able to survive if society accepts the responsibility for their protection and management. In Switzerland society is bound to accept that responsibility, because the

Swiss know that their mountainous country cannot survive without its forests. But what of the position elsewhere? And what can be done to improve the economics of forestry? The Country Reports throw only limited light on these two questions, but it does appear that the economic viability of forestry does depend to a very considerable extent on sufficient attention being given at policy level to the economics of forest management. This attention is often lacking and little or no attempt is made to evaluate in economic terms the consequences of management decisions on matters such as choice of species, silvicultural systems, length of rotation and intensity of supervision. The reason given is that such issues must not be decided solely by economic criteria. True, but the cost of departing from the economic optimum is worth establishing, especially when the economic viability of forestry is under pressure, as it is almost everywhere in Europe.

There is a strong suggestion that forest management is most advanced and profitable in countries where the state sets a good example of business-like management in a semi-autonomous state forest enterprise. The need for economic guidelines is, of course, one of degree. If the continuation of civilized life in a mountain valley depends on expensive forestry and engineering works on the slopes above, the cost of these works will understandably be only a secondary consideration in reaching the decision whether or not to go ahead. But such special cases cannot justify a general disregard of forest economics. The economic viability of forestry is, of course, closely linked to that of forest industry, because modern and efficient wood processing enterprises can afford to pay a better price for their raw material than antiquated and inefficient enterprises.

4.2.2 Multipurpose management

Virtually the whole of Europe subscribes to the principle of multipurpose management, but some countries are more explicit on this point than others. At the same time it is apparent that management objectives are becoming increasingly specialized. Multipurpose management cannot apply to a nature reserve in which there is no management other than protection, and it can apply only in a very limited way to forest biomass plantations grown on a 3-12 year coppice cycle to produce chips for fuel or pulping. Management is also very heavily weighted in a particular direction in forests with extensive leisure facilities, in forests dedicated to various aspects of nature and landscape conservation, and in commercial monocultures of fast growing tree species. Many countries recognize this by formally differentiating between forests with economic objectives and forests with special objectives such as protection, health and recreation, green belts, reserves of natural ecosystems, national parks and historic sites. In other countries the trend towards specialization seems to stem more from case by case responses to particular circumstances than from any deliberate policy. The trend towards specialization does not detract from the desirability of multipurpose management where it is practicable; but the trend exists and should be recognized.

4.2.3 Sustained yield

The principle of a sustainable yield in the broadest sense of maintaining and, if possible, improving the productive capacity of forests appears to be accepted universally although only some countries refer to the principle in their forestry policy statements or legislation.

4.2.4 Inventories and planning

An increasing number of countries now base their management policies on national forest inventories. Finland led the way with its first national forest inventory in 1921-24, followed by Sweden in 1923-29. Others, including some with a long tradition of systematic forest management such as the FRG, began their first national forest inventory after 1980. The methods used vary, but generally the inventories are based on aerial photographs (in some instances also satellite imagery) supported by ground sampling in small plots located on a systematic grid. The periodic remeasurement of a proportion of the plots facilitates the monitoring of changes, including health, which has become an important aspect of inventories in recent years. Many countries continue the traditional practice of planning forest management in fixed cycles of about 10 years. Sweden, as already mentioned, (see Chapter 2) has prepared forecasts based on various management options up to the year 2050. Other countries, especially some with centrally planned economies, have 5-year forestry programmes which form part of the 5-year national programmes for the whole economy.

4.2.5 Silvicultural practices

Silvicultural practices are mentioned as policy issues only in a few of the Country Reports. The Report for Belgium, for example, states that in the Flammande Region "the difficult aim of forest management is to achieve multiple-use forestry by a system of silviculture based on the bio-ecological principles of the natural forest".

That aim, although not stated as a policy issue, is implicit also in the silviculture practised in countries such as Switzerland and Yugoslavia while other countries such as Britain and Ireland have consciously turned their backs on what they regard as the misguided ideal of the natural forest. The countries, which favour silvicultural practices that seek to maintain a modified natural forest, continue to operate mainly with indigenous species while the other countries favour exotics in their production forests wherever exotics are more economic.

Some countries such as the FRG advocate the growing of high quality timber of large dimensions on long rotations while elsewhere, e.g. Finland, Sweden and UK, the tendency is to grow what is thought to yield the best return on the invested capital, i.e. utility saw logs of modest dimensions which can be grown on shorter rotations. These practices are, however, modified locally in the interests of nature conservation, especially if financial incentives are provided, e.g. for growing indigenous species such as oak and beech which require long rotations, but are liked by the public and help to conserve traditional landscapes.

Two incipient silvicultural trends which have been noted in a few countries deserve more general encouragement:-

(1) The increased cultivation of fast growing species such as cherry and walnut which produce high quality timber; such species are environmentally acceptable, growing them is profitable and their timber can replace that of certain tropical hardwoods if and when they become scarce.

(2) A renewed interest in secondary indigenous tree species such as wild pear and some Sorbus species which have become rare; the aim here is to maintain the diversity of forests for the benefit of future generations.

Looking to the future, it seems probable that the existing contrasts in silviculture between countries will diminish as each country widens its range of silvicultural practices to suit the diversity of management goals set by forestry policy.

4.2.6 Social aspects

The social aspects of forest management are mainly connected with employment which is dealt with in Chapter 6. Other social aspects have been a policy issue especially in Turkey where there are a large number of villages inside the forests. The villagers depend on the forest for their living and it is a point of policy to find them work in forest management.

Linked to the question of villagers living in and near forests is the problem of forest grazing. In Central and Western Europe the policy has generally been to stop grazing in forests by improving the pasture outside, but new developments in agroforestry may reverse this trend. In Eastern and Southern Europe traditional forest grazing is still common and forestry policy must provide for it.

Other aspects of management policies will be discussed under protection, conservation, hunting, recreation and utilization.

4.3 Protection

4.3.1 General considerations

The greatest threat to forests has always come from man. He has cleared forests and caused their degradation through over-exploitation, grazing, fire and atmospheric pollution. In addition, methods of forest management have contributed indirectly to pests, diseases and storm damage. Protection policies reflect these facts.

General policy points on forest protection which emerge from the Country Reports are:

- prevention of damage is better than cure;

- to be effective, protection must not only involve forestry administrations but also other central and local authorities (e.g. fire brigades, army);

- protection must have the support and active cooperation of the general public (e.g. for combating forest fires, prevention of vandalism);

- governments must define the rights and obligations of forest owners and of everybody else concerned.

4.3.2. Forest decline

In much of Western and Central Europe forest decline has caused more concern, received more publicity and aroused more controversy than almost any other aspect of forestry. The decline is attributed to atmospheric pollution - popularly referred to as "acid rain" - acting on the atmosphere and in conjunction with climatic and site induced stresses (extremes of temperature and moisture deficiency) as well as with pests and diseases which take advantage of trees weakened by the other factors. The pollution is caused mainly by sulphur dioxide (SO_2) emissions from coal-fired industrial installations such as electric power stations, and by nitrogen oxides (NO_x) emitted by car exhausts, but lead, also from car exhausts, and other heavy metals are also involved. Damage from SO_2 emissions has been known for a long time to occur near the sources of pollution. The alarming new development has been the spread of damage much farther afield and across national frontiers.

The countries that have reported serious damage are: Austria, Czechoslovakia, France, GDR, FRG, Hungary, Poland, Switzerland and Yugoslavia. Sweden has reported only minor damage despite the fact that atmospheric pollution is held responsible for the acidification of inland waters, which has in some instances wiped out all fish. Finland reports some reduction in tree growth near towns because of soil acidification, but this has been more than balanced in recent years by an overall 19% increase of increment of the Finnish forests. The Report refers to the suggestion that this increase could be due to the fertilizing effect of prolonged nitrogen deposition and a higher level of carbon dioxide (CO_2) in the air which is caused mainly by the burning of fossil fuels and to a far lesser extent by the continuing destruction of tropical rainforests.

There is now a general consensus on the causes of the forest decline, but little is as yet known on how the various factors interact in their impact on trees and much research is in progress. After the alarming increase in reported damage during the early 1980s, the situation has recently become more stable, at any rate in some countries.

The control measures that have been adopted or are still being considered are aimed mainly at reducing the levels of pollution at source and are therefore outside forestry. International agreement is vital partly because damage can be caused far from the source of the pollution and partly because the measures to reduce emissions are expensive. Countries failing to adopt the measures would thus have a commercial advantage over those that do. Not unnaturally, the worst offenders are

least enthusiastic about control measures, especially if most of the pollution they cause is blown across their frontiers to their neighbours.

The measures taken by some countries and considered by others include:

- against SO_2 pollution: restrictions on emissions from coal burning installations and pulpmills;

- against NO_x pollution:

  . promotion of lead-free petrol with the aim of eventually eliminating all leaded petrol,

  . strict car exhaust norms,

  . speed limits for motor vehicles.

Within forestry, the measures taken by various countries include:

- monitoring of spread of forest decline; international cooperation between some countries has resulted in methodologies that permit international comparisons;

- research on the type and quantity of depositions;

- research into the effects of interaction of the various factors on trees of different species and ages;

- change to more resistant tree species;

- research into counteracting forest decline by the use of fertilizers and variations in silvicultural treatment;

- study of the likely policy implications if the decline spreads: e.g. short and long term effects on European timber supply and the consequential effects on industries, markets, prices in Europe and worldwide are being investigated bythe International Institute for Applied Systems Analysis (IIASA).

Taking an overall view, it would now appear that the threat of pollution to forests may not be quite as devastating as appeared probable a few years ago but that there is still cause for grave concern and a strong case for continuing and intensifying the control measures mentioned above not just in the interests of forestry, but also because of the much broader threat posed by pollution to life on this planet.

4.3.3 Fire

Fire constitutes a forest hazard in much of Europe, but especially in the drier parts of the Mediterranean region where several hundred thousand ha are ravaged by fire every year. Most fires are caused by man and only relatively few by lightning or other natural causes. Ignorance, negligence and indifference by farmers and tourists are mainly to blame. Some people do not even realize that it is they who have started a fire, perhaps by throwing away an unextinguished cigarette end. Arson plays a major role in some countries where villagers believe that they can derive

more immediate benefit from the improved grazing that follows a forest fire than they can derive from an often poor and already degraded forest. In Italy, forests are believed to have been deliberately burnt in the hope that, once the forest was no longer there, it might be easier to get permission to build houses on the land.

The measures reported include the following:

- information and education of the public (broadcasts, lectures, instruction at schools, posters etc.);

- legal measures:

  . restrictions on smoking and lighting fires, including stubble burning,
  . duty of citizens to report fires and help in fire fighting,
  . law prohibiting construction on areas that have been burnt (Italy);

- improved methods of farming that reduce the need for forest grazing;

- silvicultural and management measures:

  . choice of fire resistant species,
  . firebreaks,
  . improved access roads,
  . installation of fire fighting equipment (fire brooms, water tanks etc.);

- use of fire danger indices to facilitate warning the public and putting forest staff, fire brigades and others concerned on alert at peak danger periods;

- monitoring systems (observation posts, patrols, aerial reconnaissance, etc.) combined with a good network of telecommunications;

- updating and testing new fire fighting methods (use of fire retardants etc.);

- training of personnel concerned in fighting forest fires;

- arrangements between neighbouring countries for cooperation between their fire fighting services, especially near common frontiers.

The arrangements for fire fighting differ from country to country but the state forestry authorities or the local fire brigades usually take the lead. Local authorities, army and air force units are also involved in some countries, especially in the case of major fires for which also medical emergency services may have to be on call.

The choice and combination of methods of fire prevention reported depend mainly on the extent and nature of the fire hazard, the available manpower, the financial resources and administrative and social

infrastructures. Some countries have been more successful than others in reducing the incidence of forest fires. For example, Albania has been able to report that in 1986 only 54 ha of forest had been damaged by fire. From the available evidence in the Country Reports it is, however, not possible to judge to what extent the experience gained in a country that has mastered the problem would be applicable elsewhere.

4.3.4 Storm damage

Storm damage to forests is most severe in Western and parts of Central Europe. Sporadic minor damage occurs almost every year and major calamities which tend to be confined to a particular region usually occur at intervals of 10 to 20 years. The main precautions reported include:

- identification of danger zones according to the degree of risk (e.g UK);

- the adaptation of silviculture, especially where the risk is greatest (choice of species, method of ground preparation for afforestation, thinning regime, length of rotation);

- Contingency plans for dealing with calamities:

  . harvesting, storing, transporting and marketing of the windblown timber,

  . planned voluntary or compulsory restrictions on normal fellings to facilitate the marketing of windblown timber,

  . phytosanitary measures to reduce risk of pests and diseases following wind damage,

  . provision for storage of windblown logs;

- the passing of laws and regulations concerning the rights and obligations of forest owners in relation to storm damage (e.g. obligation to reforest and to take phytosanitary measures, the right to financial assistance).

The Country Reports say little about the effectiveness of their national policies in respect of windblow, but the fact that there has been so little discussion about these policies in recent years suggests that the lessons of past calamities have been learnt and that the existing policies now broadly respond to what is needed.

4.3.5. Grazing

Damage to forests by cattle grazing has been greatly reduced or eliminated in much of Europe by a separation of pastures and forests, a process which has been helped by advances in animal husbandry and pasture management. Recent trials of controlled forest grazing are, admittedly, showing promising results but, after the bad experience with forest grazing in the past, these recent developments are still treated with considerable reserve by many foresters.

By far the worst damage to forests by grazing animals has been caused by goats. Spain and Yugoslavia are among the countries that took the drastic step to prohibit the keeping of goats, but there are signs that the goat is gradually staging a limited comeback. Cyprus claims to have mastered the goat problem in a less drastic way, as follows:

- giving cash payments to graziers who agreed to give up grazing and adopt other means of livelihood;
- providing employment for graziers in forests, e.g. as labourers, fireguards, forest guards;
- allowing sheep grazing in certain areas of the forests and encouraging graziers to change their goats for sheep;
- removing (with their consent) whole grazing communities from the forests and paying them compensation to settle where they wished or settling them in new villages built for them outside the forests and giving them land to become farmers;
- introduction and issue of new goat breeds, so that the numbers of animals per household could be reduced, but incomes remain the same or even increase;
- improvement of pastures and fodder production on arable land;
- introduction of an adoptive law through which villagers decide by ballot whether to exclude free-range grazing from the area of their village.

4.3.6 Pests and diseases

A number of pests and diseases of mainly local importance are mentioned in the Country Reports, but none refers to the important question of preventing the importation of pests from other countries. The omission is surprising since it is less than two decades since the Dutch elm disease (which is caused by the fungus Ceratocystis ulmi and is transmitted by the beetles Scolytus scolytus and Scolytus multistriatus) killed off most elm trees in much of Western Europe after a virulent strain of the disease had been imported into Britain from North America in logs from which the bark had not been removed. At the time, the disaster led the countries mainly affected to review the phytosanitary aspects of imports of logs as well as of forest reproductive material. These questions have been and continue to be the subject of international discussions and agreements.

For environmental reasons, many countries are now limiting the use of toxic substances in pest control with a view to replacing them with biological control or other non-toxic methods.

4.3.7 Illegal fellings and over-exploitation

Protection against illegal fellings and over-exploitation have ceased to be major issues in most of Europe, but there are a few exceptions. Thus

Albania refers to its intention to reduce fellings to the level of increment by measures which include the replacement of wood with other materials. Turkey reports a continued problem with illegal fellings.

4.4. Conservation

4.4.1 General considerations

The role of forestry in the conservation of nature and the human environment has been recognized for a long time, but has received much greater emphasis in recent decades than before. In this respect all national forestry policies accord fully with the aspirations of the Geneva Declaration.

Foresters claim with some justification that they had started to practise ecology and environmental conservation long before these terms entered general usage. It is, however, equally true that these aspects of forest management have been greatly stimulated by the influence of environmental lobbies on governments and forestry authorities. The Country Reports are reticent about the lively controversies that have arisen in this context. One head of state, the President of the FRG, has been less reticent: ".... The environment has become a central theme in private conversations, in public reporting, in science and in political controversy. The controversy has not always been agreeable. Sometimes one gains the impression that the concern is less about the environment than once again about the separation of human beings into the good and the bad". (translated from the speech by President Dr. Richard von Weizsäcker on 7 October 1986 in Bonn). In some countries, the in-fighting among government ministries and non-governmental pressure groups has led to seemingly irrational changes in the allocation of responsibilities for environmental matters; but overall, forestry and the whole environmental cause have benefited from being dragged out from a sleepy back-water into the firing line of major political controversy.

The ojectives of environmental forestry are manifold. By far the most important objectives in the mountains and throughout the Mediterranean Region are the prevention of erosion and of alternate desiccation and flooding. These objectives are pursued through watershed management and torrent control, which, in the countries mainly concerned, generally are given absolute priority.

Other major objectives throughout Europe are the conservation and, in some instances, the reintroduction of extinct native flora and fauna in their natural ecological setting. The conservation of traditional landscapes and of historic sites also receives much attention.

An important point mentioned only in a few Country Reports is that, in certain circumstances, environmental interests are best served by keeping an area free of forests. For example, the UK reports: "Although by tradition reservoir catchments were often afforested in the past, control of run-off has not been a problem in the United Kingdom, and greater concern is now expressed at the lower overall run-off from forested catchments both by water authorities and by the electricity boards who are concerned by possible reductions in the hydraulic head in potential hydro-electricity generation areas".

Environmental objections have been raised against afforestation also because it may

- destroy certain biotopes (e.g. some bogs in Ireland and UK),
- deprive some species of wildlife of their habitats (e.g. some moorlands in the UK),
- reduce variety of landscape (e.g. afforestation of farmland in heavily wooded areas such as the Black Forest in the FRG).

While the objections raised have undoubtedly been exaggerated, some forestry authorities have underestimated their validity.

4.4.2 Policy measures

The policy measures in support of environmental forestry fall broadly into two categories:

- measures which apply to forestry in general;
- measures which apply to specific areas and for specific purposes.

The general measures reported include:

- a policy preference which has already been mentioned for indigenous species, natural regeneration and for silvicultural methods thought to be in harmony with nature;
- restrictions on clear fellings;
- special financial incentives (e.g. for the planting of broadleaved species);
- compensation to forest owners either for the consequences of compulsory restrictions (on fellings, etc.) or for agreeing to special conservation measures in a particular forest.

The specific measures include:

- afforestation and forest management combined with engineering works for torrent and erosion control;
- afforestation and forest management in other special sites (e.g. dune plantations in Denmark and France or semi- desert "liman" plantations in Israel);
- the designation of forests or parts of forests for particular purposes; the classifications differ, but usually include some of the following elements:
  . forests in national parks: in some countries (e.g. Italy, Switzerland) national parks are almost treated as nature reserves while in other countries (e.g. UK) merely the cruder modern developments in farming and forestry are excluded,

- nature reserves or conservation areas for the protection of specific biotopes or particular endangered species of fauna and/or flora,
- areas of special scientific interest with similar purposes as a nature reserve, but with varying management restrictions,
- forests surrounding palaeolithic or historic sites
- protection of individual ancient trees or geological features and their surroundings,
- green zones around and between conurbations.

Most environmental forestry is very closely integrated into the broader concept of landscape and nature conservation. Some aspects of environmental forestry, therefore, either lie outside forestry or at any rate involve close coordination between the forestry authority and the other bodies concerned. This coordination may be easiest to achieve where the forestry authority itself is part of the ministry of the environment and it is for this reason that forestry has been placed in that ministry in some of the countries that have such a ministry; but there is no general consensus on whether the advantages of this arrangement outweigh the possible disadvantages in relation to the economic aspects of forestry.

The role of the public in nature conservation is emphasized among others by the GDR: "A special task is the mobilization of a wide public for the protection of nature. This is performed by the Society for Nature and Environment, which belongs to the Cultural Association of the GDR and has 50,000 members."

A crucial point barely mentioned in the Country Reports is the role which non-governmental organizations play in promoting the cause of environmental forestry by acquiring woodlands and managing them in accordance with their ideals. This movement is significant in the Netherlands. Another prominent example is the National Trust in Britain; this has over one million members and owns several thousand ha of woodlands which form part of its numerous holdings of historic buildings and of environmentally important cultivated and wild countryside.

What individual woodland owners in Europe are doing for conservation quite independently of government policies, incentives and restrictions tends to be underestimated, because the achievements are out of public view. Government policies are important, but they alone do not determine what is being done.

4.5 Recreation

4.5.1 General considerations

The mobility afforded by the motor car and increased leisure have enabled an ever-growing number of people to escape from towns to the countryside where woodlands can afford pleasure and relaxation to those who enjoy nature, fresh air and peace. Moreover, woodlands suffer as a rule less from damage by visitors than farmland because trees cannot be trodden underfoot like farm crops.

All Country Reports reveal an awareness of this rising demand for forest recreation and indicate the measures which have been taken and are

planned. The policies which naturally differ to suit local circumstances are thus in line with the Geneva Declaration. The policy issues which have been considered include:

- the extent and nature of the demand (e.g. Hungary reports a wide ranging survey as a basis for developing recreation forests);
- the type and location of recreational opportunities (nature trails, picnic sites, car parks, camping facilities etc.);
- the views, rights and obligations of forest owners;
- the reconciliation of recreation with nature conservation.

The policies fall into two broad categories, first the right of access to forests by the public and, secondly, the provision of leisure facilities where access has been granted.

4.5.2 Access

Historically, the right of access has varied greatly in different parts of Europe. In Scandinavia where the population is small in relation to the forest area, the public has not only always had free access to all forests but it also has the right to pick berries and mushrooms and, subject to some restrictions, also to camp temporarily. Sweden reports an annual harvest of 100M litres of berries and 20M litres of mushrooms. Finland comments that only about 2% to 3% of the berry crop are picked every year. In a number of other countries, including France and Italy, access until recent times was tolerated but did not constitute a legal right. In yet other countries, e.g. the Netherlands and the UK, landowners were and are still entitled to prohibit access to their forests but an increasing number no longer try to keep the public out.

All countries have reported that their publicly owned forests have been opened to the public irrespective of the legal position. Usually access is subject to some restrictions, e.g. access is confined to pedestrians and visitors are excluded from areas where wildlife must be left undisturbed or where visitors might interfere with or get hurt by logging operations.

For forests in private ownership the position continues to vary from country to country but, where there is no right of access, owners may be encouraged by financial incentives to open their forests to the public. The incentives are to compensate for the extra costs incurred, e.g. for litter collection and safety precautions. A point not mentioned in the Country Reports is that some owners are, in fact, reluctant to open their forests because of the liability they may incur if a visitor has an accident such as breaking a leg on a slippery footpath. This is an example of the legal and policy problems which remain to be resolved in some countries and which may have implications also outside forestry.

4.5.3 Facilities for forest recreation

Facilities for forest recreation (other than access) which produce no

revenue are normally created and maintained by the state and other public authorities in their own forests. The relatively few private owners who provide such facilities either free of charge or against payment do so voluntarily.

The Country Reports reveal the careful planning that goes into the creation of recreational opportunities in forests. Almost invariably, the emphasis is on the peaceful enjoyment of nature, healthy exercise and the promotion of a better understanding of nature, but other forms of recreation are not necessarily excluded. Thus, in Denmark and the UK, even car rallies may occasionally be permitted; the justification is that car rallies cause less nuisance on forest roads not frequented by ordinary traffic than they would cause elsewhere.

A distinction is commonly made between forests in the immediate surroundings of towns, forests within reach of day visitors, and forests that are farther afield. A few countries also differentiate between forests that provide general facilities and forests that cater for a particular type of recreation, e.g. hunting or fishing.

The most commonly provided facilities include a system of well signposted and maintained paths, seats, picnic areas, rain shelters, children's play facilties, car parks and lavatories. In more remote areas, some forestry administrations have either provided or arranged for others to provide camping facilities or chalet accommodation. The greatest demand for forest recreation generally exists near towns and centres of tourism in the mountains or near lakes and rivers.

Conflicts between recreation and nature conservation are minimized by concentrating the leisure facilities in those parts of a forest which are least sensitive from the point of view of nature conservation. Experience has shown that only relatively few visitors venture far from facilities and well marked paths.

4.6 Wildlife management and hunting

Wildlife management embraces hunting, but hunting interests do not always coincide with those of wildlife management. The objectives of the wildlife policies, although couched in different words, all correspond broadly to a formulation proposed by the Commission of the European Communities (CEC) in 1979 (Forestry Policy in the European Community. Bulletin of the European Communities, Supplement 3/79):

"(1) to maintain a healthy, but not excessive population of as many species as are appropriate to a region and in harmony with local traditions;

(2) to avoid, as far as possible, interference with other aspects of forest management and agriculture, especially through game damage".

The successful implementation of such a policy not only achieves these objectives, but also provides hunters with the pleasure of their sport,

the state and other forest owners with revenue from hunting licences and shooting leases, ancillary employment in rural areas and a popular addition to human diet.

Clashes with wildlife policies have occurred in countries where insufficient restrictions on hunting have led to the extermination of some species and the decimation of others. Italy, for example, reports that up to the 1970s fauna had received almost no legal protection, but that the position has now changed. A law passed in 1977 established that all animals are an inalienable national heritage, and there are also proposals for legislation before Parliament to adapt Italian rules more closely to international conventions to which Italy is a signatory (Ramsar, Paris, Bern, Bonn, Washington).

Clashes with wildlife policy have also occurred in the opposite situation where populations of game and of deer in particular have been allowed to build up to levels at which the ecological balance is upset and severe damage is done to forests as well as to farm crops. An extreme but by no means unique example is Austria which lists game and pollution as the two worst sources of damage to forests. Where the right to hunt is associated with forest ownership, the reason for the excessive build up of game populations is that the owner either gets sufficient pleasure from hunting or sufficient money from letting the hunting rights to be prepared to accept the damage. The Netherlands have sought to counteract this tendency with a ruling which renders forest owners with excessive game populations ineligible for certain forest subsidies.

It appears that the Nordic and Eastern European countries have found less difficulty in reconciling hunting policies with wildlife management than the countries in the West and South of Europe.

Rare and endangered species occupy a special place in wildlife management and it is gratifying that the policies adopted to secure the future of species such as bears, eagles and lynx have shown promising results and that, in some instances, a limited amount of hunting has again become possible. The reintroduction of species that had become extinct in a region has also been reported.

On the other hand, none of the Country Reports refers to the measures that have been taken to prevent the introduction of alien species and thus prevent a repetition of past unpleasant experiences. An example is the careless importation of the American grey squirrel into Britain, which strips the bark off broadleaved trees and has ousted the indigenous red squirrel from most of the country. There is also no mention of the tests on which some countries insist as a condition for permission to hunt. The tests usually include proficiency in the use of hunting weapons, knowledge of the game and of hunting legislation. Countries without such tests would do well to consider their introduction. Accidents to human beings and unnecessary suffering by game might thus be avoided.

Hunting and conservation of wildlife affect all land and not only the forests. Many interests are thus involved, both governmental and non-governmental and the organizational arrangements for coordinating these interest groups vary greatly according to the traditions and legal

situation in each country. In the countries with centrally planned economies, the coordinating role of the state is usually decisive. In other countries, the right to hunt is either associated with landownership subject to a minimum size of holding or hunting is virtually uncontrolled. It is where hunting has been unrestricted that the greatest damage has been done.

Forestry authorities invariably exercise some influence over hunting and wildlife conservation also outside the state forests, but it is only in some countries (e.g. GDR and FRG) that the forestry administration is the government department responsible for hunting affairs.

Hunting has become a tourist attraction in countries that can boast unusual species such as bears (e.g. Yugoslavia) or elks (e.g. Sweden) or outstanding trophies of more common game such as red deer (e.g. Czechoslovakia, UK). No serious conflict with other forms of forest recreation has been reported.

Angling which is even easier to reconcile with general recreation is very popular wherever facilities are offered. Forestry administrations whose responsibilities include inland waters and fresh water fisheries enjoy the advantage of being able to provide such facilities.

The progress made in wildlife management throughout Europe undoubtedly owes much to international cooperation which has resulted in the conventions of Ramsar, Bern, Bonn, Paris and Washington; the provisions of these conventions are at least partially observed also by states which have not yet become signatories.

5. UTILIZATION, TRADE AND MARKETING

5.1. Trends of production and consumption

The forecasts of production and removals in Europe, excluding the USSR, which were made in ETTS IV are summarized in table 5.1 below.

Table 5.1.

Europe: ETTS IV forestry forecasts to 2020

	Unit	Base period around 1980	2000		2020	
			Low	High	Low	High
			(million units)			
Area of exploitable closed forest (ECF)	Ha	133	138	141	142	148
Growing stock in ECF	m^3 o.b.	16330	18509	18109	20056	19213
Net annual increment in ECF	m^3 o.b.	504	541	566	565	615
Fellings in ECF	m^3 o.b.	402	453	506	504	569
Total removals	m^3 u.b.	341	391	438	431	490

The main points to note are:-

(1) Growing stock, increment, fellings and removals will continue to rise; under the higher forecast of fellings, the growing stock will, of course, rise more slowly than under the lower felling forecast.

(2) Increment is expected to exceed fellings well into the 21st Century; the main reasons cited are environmental constraints on fellings and an insufficient price to cover the cost of harvesting where access is poor or markets distant. Wood of small dimensions or indifferent quality is most seriously affected. To counteract these difficulties some countries offer financial incentives (e.g. for thinnings, forest road construction, purchase of harvesting equipment).

(3) The removals of 341 M m^3 in 1980 compare with about 300 M m^3 in 1950.

In the USSR, removals have remained at around 360 M m^3 for the past 20 years. The Country Report includes no forecasts, but the vast forest resources of the country, combined with the steps that are being taken to intensify management, will undoubtedly permit a substantial increase of removals on a sustainable basis. The difficulty might lie in the long distance of the forests in Siberia from possible markets.

Trends in production and consumption of the major groups of forest products are shown in table 5.2.

Table 5.2.

Trends in Production and Apparent Consumption of Major Groups of Forest Products

million units

PRODUCT	EUROPE (excl. USSR) 1950	1980	Forecasts 2000[2] Low Estimate	High Estimate	USSR[1] 1950	1980
SAWNWOOD(m^3)						
Production	61	93			49	99
Consumption	62	102	119	141	55	92
Balance	-1	-9			-6	+7
WOOD-BASED PANELS (m^3)						
Production	3	34			1	10
Consumption	3	36	50	58	1	9
Balance	-	-2			-	+1
PAPER & PAPER BOARD (m.t.)						
Production	12	51			1	9
Consumption	11	49	67	92	1	9
Balance	+1	+2			-	-
FUEL WOOD (m^3)						
Production[3]						
Consumption	122	72	86		112	79

Source: ETTS IV as quoted by E.G. Richards (1987): Forestry and Forest Industries: Past and Future.

Notes: (1) No forecasts available for USSR.

(2) Only consumption forecasts available for Europe, excluding USSR.

(3) In the case of fuelwood, production is very similar to consumption as there is very little intercontinental trade.

The trends of supply and consumption as summarized in tables 5.1. and 5.2. led to the statement in the Geneva Declaration: "In short, it is foreseen by ETTS IV that in the coming decades supply of wood and its products to the European market will be adequate to meet the expected growth in demand, provided that afforestation and reforestation efforts and intensified management are in fact realised."

5.2. Logging and transport

The changes in logging practices that have occurred in the past decades have been dictated by advances in technology rather than by changes in policy. Several trends are apparent:

- increased mechanization which necessitates more capital investment in logging equipment and more highly trained operators; this has led in some countries (e.g. Denmark, Finland) to more logging being done by independent contractors and less by small woodland owners; in publicly owned forests and on large private estates, on the other hand, all or part of the logging operations tend to be carried out by the owners, especially where there is a danger of damage to natural regeneration or where the owners do not wish to become too dependent on outside contractors;

- increased productivity resulting from mechanization: e.g. Finland reports a tripling in productivity between 1970 and 1985;

- more complete utilization of the wood that is harvested - lop and top etc.;

- more widespread use of shortwood harvesting systems;

- a network of forest roads which is less dense but of a higher standard than before.

The pace of change has varied enormously, but it is significant that even in countries such as Finland and Sweden which have taken the lead in the introduction of fully mechanized logging with processors and other sophisticated equipment, motor manual methods based on the use of chain-saw and farm tractors still account for nearly half of all timber harvested.

A difficulty voiced in several reports (e.g. France, Portugal) lies in the fact that the woodland owners are generally in a much weaker bargaining position than the purchasers who may either be independent contractors or forest industrial enterprises. The imbalance arises where many small vendors are confronted by few large purchasers. Various methods have been tried to rectify this imbalance. One method has been to establish forest owners' associations which then negotiate as a body. Some governments have promoted the formation of such producer groups and assisted in the negotiations. In some parts of Britain, a joint system of tenders with the Forestry Commission has been established to facilitate the marketing of timber in the private sector. In Portugal, the Government has assisted in a different way by fixing the price of pulpwood delivered at mill. Fewer difficulties arise where there is adequate competition between purchasers; too much competition caused by excessive

wood processing capacity has, however, also proved to be unhealthy, because of the wasteful under-utilization of that capacity. Sweden reports that the domestic supply of roundwood has been insufficient during recent years. This situation led to the inclusion of certain minimum cutting rules in the Forestry Act with effect from 1983. It also led to increased wood prices and to a shift from sales of roundwood delivered at the roadside to sales of standing timber. The new market situation has brought about the creation of strong purchasing companies owned by the pulp and paper industry. These companies now compete successfully for the purchase of wood with the Forest Owners' Associations and with private sawmills.

Except in countries where the allocation of wood to industry is planned centrally, commercial rather than policy considerations dictate the method of sale:-

- As already mentioned, in some instances prices are fixed by government or by negotiation between individual sellers and buyers or between sellers' and buyers' organizations. Denmark reports that sawmillers are supplied with roundwood from national forests almost proportionately to their previous consumption, as long as they comply with the general prescriptions and agreements, and can be relied upon to pay. Minor produce such as stakes or Christmas trees are often sold at a price fixed by the vendor.

- Sales by auction make for market transparancy and are generally favoured where there are sufficient potential purchasers to prevent the likelihood of collusion between them.

- Sales by sealed tender are usually preferred where the risk of collusion outweighs the advantage of market transparency or where the market is so uncertain that the vendor wishes to keep his options open.

- Long-term contracts, especially for the supply of pulpwood, have been offered by the British Forestry Commission and by the Forest and Wildlife Service in Ireland as a means of attracting new industries where they were needed; the quantity and quality of the raw material to be supplied, the initial price, the method of indexing the price to take account of changing circumstances (money value, labour costs, price of end product etc.) and duration of the contract are negotiated between the parties. The system seems to have worked well where its application has been strictly limited. Otherwise it may lead to a distortion of the market and to other difficulties. The Country Report for Ireland, for example, mentions that the sawmilling industry attributes shortages of sawlogs to the fact that some sawlogs had to be channelled to the pulp industry in order to meet long-term supply contracts for pulpwood.

The EEC classification of wood in the rough is mentioned in the Country Report of the FRG, while a few other Reports (e.g. France) refer to alternative systems of classification that have been introduced or are being considered. Norway reports a special Act on the grading of wood for sale. Under this law "grading associations" have been set up for regions or districts. All wood for use by domestic industries must be graded by

personnel from these associations. In Sweden, most timber scaling is done by timber measurement associations formed by interested parties from the sellers' and buyers' side. There is also a Swedish Board of Timber Measurement consisting of representatives of buyers and sellers. In most countries, however, the question of log grading does not appear to be a significant policy issue.

Logging is severely restricted or even prohibited in nature reserves, national parks, areas of special scientific interest etc., where environmental objectives have absolute priority. In most forests, however, the main environmental constraints on logging are those which have been imposed by the forestry authorities themselves: e.g. the avoidance of major clear-fellings and the favouring of shelterwood systems on slopes or the restrictions on logging in recreation forests. Constraints resulting from external pressure by environmental lobbies appear to be limited at present and the UK specifically reports that environmental restrictions on matters such as size and shape of felling coups have little effect on costs. There is, however, a fear among European foresters that misguided attempts at outside interference with logging methods may become more serious in future.

Transport of timber by rail and water has declined sharply in favour of road transport, despite the restrictions on maximum loads which apply nearly everywhere in Europe.

5.3. Forest industries

5.3.1 General considerations

Forest industries have received very uneven treatment in the Country Reports. The Belgian Report confines itself to the statement that forest industry is completely separate from forestry and comes under the Ministry of Economic Affairs. The Reports for Denmark and Netherlands disclose that these countries have no national policy as such for the wood processing industries. That may also apply to some other countries that are silent on the subject. Portugal refers to the development plan for forest industry which has been prepared but not yet implemented. In Ireland and the UK, where production is rising rapidly, it has been government policy to undertake or to commission studies to advise on forest industrial development strategies. These studies serve as guidelines to both government and industry.

Not surprisingly, forest industrial planning has received particular attention in the USSR which reports as follows:-

> "Forestry and the timber and wood processing industries are developed on a planned basis. The main basis of management in the socialist economy is long-term forecasting and planning, the principal task of which is to achieve set growth rates of production in the branches so as to better meet national requirements with minimum production expenses and rational and comprehensive use of natural resources.
>
> Forecasts are long-term - 20 years or more. Long-term plans are made for 10 years in the context of the 5-Year Plans. The 5-Year Plan is

the main way in which industrial production is planned and organised; it is a state document, determining the main thrusts of industrial activity in forestry, its territorial industrial forestry associations and enterprises.

Economic and mathematical models are applied in the preparation of long-term forecasts and plans.

In defining a development strategy for the forest complex, the siting of industrial wood production in the country is optimised, and the raw materials policy and trends for the rational use of raw timber and the size and structure of timber exports, are determined. Of the many variants, the one is selected that minimises production and transport costs and best meets national wood production requirements and the optimum development of timber exports. Thus account is taken of the important principle of the location of production forces in the USSR - the rational distribution of labour between economic regions in order comprehensively and effectively to use the natural resources and ensure the complex development of each region's economy".

In countries with market economies and well developed forest industries, these industries themselves usually play a significant role in shaping forest industrial policy. A common arrangement is to have a council, or a forum to discuss the problems, policies and strategies relating to forest industries. The Government, the various forest industries and, in some instances, also private woodland owners, consumer organizations, professional organizations and local authorities are represented on these bodies.

Linkages between industry, government and forest owners are particularly strong in countries such as Sweden and Finland where forest industrial enterprises, the state and forest owners' associations all own and manage forest industries as well as forests.

Few countries depend on market forces alone to maintain a balance between wood supplies and forest industrial capacity. The main mechanism for preventing over-capacity are consultations within the bodies mentioned above and various kinds of planning controls. Yugoslavia, for example, reports that "organizations concerned with the industrial processing of wood are obliged, when a new factory is being built or an existing one expanded, to obtain an opinion on the socio-economic justification and evidence concerning the availability of the raw material supplies. This opinion is issued by chambers of the economy and self-management communities of interest for forestry".

Where rising supplies resulting from major afforestation programmes as in Britain and Ireland call for the establishment of new forest industries, governments have promoted feasibility studies and offered financial incentives as well as guaranteed supplies of raw material.

The standardization of wood products is generally regarded as a task for industry but, insofar as they are applicable, the norms proposed by the international and European standardization organizations (ISO and CEN) are widely respected even in countries where they are not obligatory. Standardization has gained special importance in building and safety regulations where there continues to be considerable room for improvement. Yugoslavia reports that products manufactured in accordance with Yugoslav standards may, on request, by sorting, be adapted to the standards of importing countries. Conversely, the dominance in Denmark of Swedish sawn softwood for construction has led to the general adoption, at least for bulk supply, of Sweden's major uniform grading system: "GRÖNA BOKEN".

While no serious dissatisfaction has been expressed over existing arrangements, it does seem that international timber trade in Europe would benefit from the development of common standards covering dimensions, quality, and possibly also moisture content and preservation treatment.

Policy trends in wood processing that have been highlighted in several country reports include:

- the more complete and efficient use of the raw material;

- research to keep wood competitive with other materials in construction, furniture making, packaging etc.;

- wood promotion programmes in order to ensure that architects and other potential large-scale users of wood fully understand its potential and limitations;

- a drive for continued modernization and rationalization, aided in some instances by financial incentives such as tax concessions or loans on favourable terms; while rationalization generally leads to the closure of small enterprises, some countries (e.g. the FRG, Yugoslavia) have a policy to help also smaller enterprises to become more efficient and competitive;

- greater attention to environmental considerations;

- more rigorous safety measures to protect those employed as well as the general public; for example, Portugal reports: "Forest industries are obliged by a law of 1966 to guarantee the health, well-being and safety of the public".

Some of these points will be elaborated under the individual industries. More progress has been made in some countries than in others, but everywhere there is room for improvement.

The indirect impact of forestry and forest industries on national economies can be great, a point that is emphasized in the Country Report for Finland:-

> "The indirect impacts of forestry and the forest industries on the development of Finland's economy are even greater than the direct ones. They were the basis for the development of the metal industry,

electronics and shipbuilding. Machines and boilers for new pulp and paper mills were needed, as were their control lines. Processors and harvesters were needed for the mechanization of harvesting, trucks and cargo vessels for the transport of wood and forest products".

5.3.2. Sawmilling

With a production of 93M^3 of sawnwood in 1980, Europe, excluding the USSR, accounted for 21% of world production which stood at 436M m^3. The USSR with its production of 99M m^3 accounted for another 23% of world production in that year. As indicated in table 5.2, a slight negative trade balance for sawnwood in the rest of Europe is offset by a slight positive balance for the USSR.

The sawmilling industry is the oldest and by far the most fragmented primary wood processing industry. Rationalization and modernization have progressed farthest in Scandinavia and also in the USSR where sawmilling production technology is reported to be moving towards the output of specified products (glued components, planed sawnwood and other semi-processed products that have a special functional purpose). At the other extreme are countries such as Greece which reports that most of its sawmills, except those for top quality wood, are out of date. In most of Europe, modernization has still very far to go and much sawmilling continues to be a way of life rather than an economic enterprise.

The degree of fragmentation is illustrated by the few countries that have supplied figures. Switzerland reports a decrease of forest industrial establishments (sawmills and others) from 12500 in 1975 to 10,600 in 1985; over 90% of the enterprises have fewer than 20 employees, and only 2% have over 50. Italy reports 120,000 enterprises of which only 10,000 employ more than 10 people. Turkey reports having 7960 private sawmills with an annual outturn of 10.6M m^3, and 27 state-owned mills with an outturn of 1.1M m^3. The private mills are utilizing 55% of their capacity and the state mills only 30%. Several other countries also mention that their sawmills are running far below capacity.

The main aims of modernization are to:

- improve the product by more accurate sawing, better seasoning, etc.,
- make the product more reliable by better seasoning and grading (e.g. mechanical stress grading),
- increase productivity and reduce costs.

To achieve these aims:

- substantial capital expenditure on equipment is needed;
- managers and operators must be highly skilled;
- optimum use must be made of the raw material; this has resulted in a trend by sawmills to accept logs of small dimensions (diameters of 15 cm or even less) and to utilize the residues for energy or for reprocessing into panel products (particle board, fibreboard, etc);

- sawmills must not be too small; modernization, therefore, inevitably results in a reduction in the number of sawmills; this process of rationalization is going on throughout Europe at various rates and is continuing even in the countries where modernization has advanced farthest; sawmills specializing in particular products or geared to supply particular local markets have, however, demonstrated that small mills can remain viable under certain conditions.

5.3.3. Wood-based panel products

The consumption of wood-based panel products increased more than tenfold between 1950 and 1980 and further increases are expected, although at a slower rate (see table 5.2). Production has risen accordingly. The development of these products together with other advances in timber technology (laminated beams etc.) have helped to keep wood competitive with other materials; these developments have also greatly increased the scope for making good use of residues and of wood of small dimensions or of indifferent quality. The above trends are one reason why some countries have opted for a policy of growing utility timber of modest dimensions instead of growing high quality timber of large dimensions. While most panel products are manufactured from local material, Cyprus and Israel report plywood plants based on imported logs.

Environmental policy constraints to which the report of the FRG draws attention arise in part from the risk to health from the formaldehyde content of glues in panel products which are used in dwellings; the possible carcinogenic effect of oak and beech wood dust generated in wood processing are also mentioned.

5.3.4 Pulp and paper

Europe's pulp and paper industry is riding high on a boom that has lasted longer than most in this highly cyclical and capital intensive sector of the forest industry. Production which had risen in Europe (excluding the USSR) from 12M m.t. in 1950 to 51M m.t. in 1980 has risen by almost another 30% since then. In the USSR, production rose from 1M m.t. in 1950 to 9M m.t. in 1980 and to 10M m.t. in 1985.

The main policies for the development of this sector have been and continue to be directed in four main directions:

(1) increased use of logging and sawmill residues and of recycled paper;

(2) raising the yield of pulp by the introduction of new pulping methods (e.g. thermo-mechanical pulping);

(3) improvements in paper making which:
  . reduce the thickness needed for a particular purpose and
  . permit a higher proportion of inexpensive fillers (kaolin);

(4) reduction of the environmental nuisance caused by pulp and paper industries; this has been the key issue in some countries; Sweden reports:-

"Within the pulp and paper industry there has been a development of utmost importance: it is the introduction of closed circuit processes which drastically reduce effluence and emission as well as energy losses".

The installation of closed circuit systems is, however, expensive. That is why some other countries have not been able to introduce them and why, as a result, any proposed expansion of the pulp industries meets with strong environmental objections (e.g. Portugal and Spain).

A basic problem in parts of Europe (e.g. Italy, FRG, UK) has been the dependence of the paper industries on imports of pulp from exporters of market pulp who also produce paper and thus compete with their foreign pulp customers in the paper market. This conflict of interests has sometimes led to the pulp exporters being accused of charging a relatively high price for the pulp and a relatively low price for paper.

5.3.5 Other forest industries

Various other forest industries are of importance locally. The cork industry in Portugal is the prime example. Portugal is the largest producer of cork in the world and the industry, which is labour intensive, gives rise to much badly needed rural employment. Policy problems include the catching up with the regeneration of old stands (which for various reasons has fallen behind in the past few decades) and the development of new products and markets for the cork that is below the standard required for bottling wine.

The resin industry has been in decline for decades, but survives locally mainly for the production of high quality products such as colophonium. A variety of small woodland craft industries are encouraged here and there but barely figure in the Country Reports except for references to the rising use of bark for horticultural purposes and to the tendency of industries to develop downstream, e.g. in Italy for the furniture industry to move into installation.

5.4 Wood for energy

There are three main sources of wood for energy:

- the existing forests,
- residues from wood processing,
- new short rotation energy plantations.

Great strides have been made in recent years in the utilization of residues from conventional forestry. The developments include:

- improved small machines of various kinds which have reduced the cost of harvesting trees of small dimensions,

- improved machinery for on-site chipping of small trees and of lop and top,

- new equipment for whole tree logging and transport.

The momentum for this progress has been generated by industry. Much, however, remains to be done. Each year millions of cubic metres of wood are left unharvested in the forest.

Energy is still generally regarded as the market of last resort and preference is given to the pulp and wood-based panel industries which add more value to the raw material. At present prices of fossil fuels no conflict of interest arises, but the conflict may reappear when energy prices recover to the levels reached in the 1970s. It may then again become a policy issue to decide whether or not to interfere with the marketing of wood that could be used either for energy or industry.

Residues from mechanical wood processing are nearly all used for the generation of energy in the processing plants themselves except where they are reprocessed for further industrial use.

The greatest scope for expanding the economic availability of forest biomass for energy appears to lie in new plantations of broadleaved species managed on coppice rotations of 3 to 10 years. Some of the relevant policy decisions (e.g. the Austrian programme to plant 1800 ha per year of such plantations on good farmland) have already been mentioned under afforestation. The European Community's interest in the subject is demonstrated by the research and development work that is being conducted in several member states and from a comprehensive study that has recently been published under its auspices (Ed. F.C. Hummel, W. Palz, G. Grassi (1988), "Biomass Forestry in Europe: A Strategy for the Future". Elsevier Applied Science Publishers, London & New York, pp. 600). The Study concludes that forest biomass plantations would constitute the most sensible land use on anything between one and five million ha of the 15 million ha that are surplus to agriculture in the European Community. The biomass could be used both for energy and for pulping. The Study emphasizes that forest biomass plantations should only be considered on relatively good, flat agricultural land and near potential markets. The Study also points to the economic, social and policy questions that remain to be resolved which include the following:

unsubsidized forest biomass plantations cannot be expected to compete against subsidized agricultural and conventional forestry crops;

in some countries legal restrictions on ownership of agricultural land and on changes in land use would have to be removed;

a change from annual crops to forest biomass plantations creates cash flow problems for farmers during the years until the first harvest; these problems would have to be countered by temporary subsidies;

extension work is necessary in order to familiarize farmers and other potential growers with the technology and with the expected advantages and limitations.

The revival of the demand for fuelwood which was sparked off by the energy crisis of the 1970s has been given an additional boost by the recent development of more efficient and more convenient wood burning stoves and district heating installations. The conversion of residues into briquets to facilitate handling is mentioned by Hungary. Several countries have encouraged wood burning by the offer of various financial incentives. Progress has been most rapid with small and medium sized installations for dwellings, farms, horticultural establishments or as

Outside the wood processing industries themselves where residues are freely available, the use of wood to generate power on a large scale is rare because of the relatively low cost of fossil fuels, but Yugoslavia reports that wood is increasingly used for power generation.

Policies to promote energy conservation by the use of wood are exemplified by the Hungarian programme to build 2,000 energy saving houses with prefabricated components and the manufacture of OSB (orientated strand board) and MDF (medium density fibreboard).

5.5 Trade

The contrast in forestry policies between countries with centrally planned economies and countries with market economies is, as one might expect, most apparent when it comes to the handling and distribution of forest produce and products. Even within each system there are significant variations between countries.

Central planning appears to be most complete in Albania and Bulgaria.

Albania: "Wood distribution and supply are governed by a plan which takes account of the needs of the diverse sectors of the national economy and of the population. Our country imports no wood or wood products but it exports chairs, plywood and some other products".

Bulgaria: "Wholesale and retail trade in timber is entirely a privilege of the State right from the point where the logs are harvested by each forestry district. That privilege also applies to imports and exports of wood and wood products. Exports are kept to a minimum because of the shortage of wood to meet domestic requirements. A very small amount of wood is imported, mainly from Africa, in order to meet the needs of the furniture industry".

By contrast, the policies of market economies are exemplified by the following statements:

Austria: "In the timber trade the law of the free market prevails. This applies to the home market as well as to export and import".

Denmark: "Domestic and international timber trade are virtually free of restrictions".

Some countries in Western Europe such as Sweden take free trade in timber so much for granted that they do not even refer to the matter in their Country Reports.

Other market economies (e.g. Italy, UK) report restrictions on free trade which result from the application of phytosanitary measures and measures against dumping. Also countries which do not mention these restrictions are known to enforce them.

Trade policies which represent modifications of central planning or of the free market have also been reported, e.g.:-

Cyprus: "The Government protects locally produced timber products by means of import duties and, occasionally, by import restrictions".

Finland: "Sellers may select the buyer as well as the time and amount of their sales as long as the quantity of timber cut complies with the provisions of the Law Concerning Private Forestry. ... As far as international marketing is concerned, restrictions have been imposed on timber sales. The seller may not sell the timber at a price lower than the recommended price, but no attempt has been made to regulate the exports of manufactured forest products".

Hungary: "Enterprises are authorized to carry on wholesale or retail timber trade. In this respect the only exceptions are the imported softwood logs and sawn softwood, for which the biggest Hungarian timber trading company has an almost monopolistic position in the domestic market. .... Concerning foreign trade, all Hungarian enterprises (producers and traders) have the right to import from or export to convertible currency markets the majority of forest products".

Israel: "There are practically no limitations on timber imports except that they may be made subject to barter agreements based on reciprocity".

Probably the most significant recent development affecting the timber trade in Western Europe has been the ending of virtually all tariff barriers, at first within the European Community and subsequently also between the EC and the European Free Trade Area (EFTA) (Austria, Finland, Iceland, Norway, Sweden, Switzerland).

In the EC, the planned completion of the single market in 1992 will involve the elimination of the remaining tariff barriers between the Member States. The prospect of 1992 has already induced forest industries outside the EC, especially those in Scandinavia, to buy or establish a manufacturing capability within the EC.

An issue of timber trade policy which has aroused serious controversy concerns the importation of tropical timber into Europe. The cessation of these imports has been advocated as a means of discouraging the continued destruction of tropical rain forests. The opponents of the idea argue that the best incentive to manage tropical forests on a sustainable basis is to increase the forest-based revenue of the countries concerned and not to deprive them of it. Two proposals for increasing that revenue have been put forward.

The first proposal is to develop more wood processing industries in the exporting countries so that more value is added to the tropical timber before export. Some developing countries have already moved in this direction and have reinforced the policy by prohibiting the export of logs. European countries and international organizations have assisted with such forest industrial developments.

The second proposal was outlined in the Commonwealth Forestry Review in September 1988 (Vol. 67(3), No. 212):- "The Timber Trade Federation obtained unanimous backing from representatives of the tropical timber importing and manufacturing trades to pursue the suggestion of making a surcharge on all forms of tropical timber imported into Britain. This is planned to raise an annual figure of US$30M which is to help producing countries counteract forest loss. The Netherlands has adopted a similar policy."

Sensible initiatives to promote sustained yield management in tropical ranforests deserve the support of all countries in Europe and elsewhere which import tropical timber from developing countries. Such initiatives, however, do not in any way detract from the desirability of growing more high quality hardwoods in Europe. World demand for high quality hardwoods, whether grown in the tropics or in temperate climates, has always been strong and is bound to rise further with rising living standards. On the other hand, even the most optimistic forecasts do not envisage a sustainable increase in the supplies of high quality tropical hardwoods.

5.6 Marketing

The policy objectives for marketing, as summarized in the Country Report for France, are almost universally shared:

To develop markets in step with rising production by:
- search for new markets;
- promotion of the use of timber;
- promotion of exports, especially of products with a high added value.

Little is, however, said in any of the Reports about the measures taken in support of these objectives.

Concerning the search for markets, the Swiss Timber Forum in its report of 1985 identified an insufficient knowledge of the market as one of the main difficulties confronting the wood processing industries. It appears that steps to improve market transparency might also be of benefit elsewhere.

The promotion of the use of timber requires the effective dissemination of knowledge to architects, engineers and other major potential users of timber, a point that has already been made; but it also requires an increased effort in research and development, if timber is to remain competitive with other materials.

The policy of adding as much value as possible to timber before export is widely advocated, but is perhaps taken too much for granted. There may be circumstances where the extra capital investment and energy needed for further processing may not yield commensurate returns. Each case deserves to be examined thoroughly on its own merits.

In sum: while the Geneva Declaration's conclusion that "the forest and forest industry sector should take up the challenge to improve the marketability of its products" is endorsed in the Country Reports, action appears to lag far behind the good intentions.

6. EMPLOYMENT

6.1. General considerations

Employment in forestry is too varied to permit many generalizations. On the one hand there are the state and other large forestry organizations that employ significant numbers of people in different grades and specialities; at the other extreme there are the millions of small woodland owners who do most of the forestry work themselves as a part-time occupation; in between these are individuals and organizations that provide harvesting, transport, silvicultural and various other services to forest owners, public and private. The situation in the forest industry is somewhat analogous, but the Country Reports have said too little to permit further comment.

The problems arising from the fragmentation of employment have been highlighted in the Country Reports for Denmark and Poland.

Denmark: "A Commission on Forest Policy, set up by the Ministry of Agriculture and now about to finish its report, has concerned itself with the change in the pattern of management of private forest properties which took place in Denmark during the period, 1961-84. During this period the number of supervisors on private estates decreased but the two big advisory groups ... both increased their forestry staffs. The Commission believes that different property structures need different management structures; but that lasting solutions must be founded on organizations which are either big enough themselves or have access to big organizations and service bodies, so that

- an internal professional creative environment can grow and be maintained;
- an efficient office environment can be made and maintained;
- communications betweeen owners, customers and providers of services can be created and maintained; and
- the organization can make sure that all staff members get adequate in-service and continued training".

Poland comments: "The great fragmentation of non-state forests does not create either the need or the conditions for the employment of highly qualified personnel".

Technological progress inevitably leads to a reduction in the numbers employed, to a diversification of activities, and to increased specialization. The pace of change brought about by these factors depends largely on economic and social circumstances and may also be influenced by national policies. Policies, however, while able to influence the pace of change and to mitigate any adverse consequences, cannot stop the above developments without which the irresistible demand for better living conditions cannot be met.

Spain states that it has no general employment policy for the forestry sector and the same may apply to other countries which do not specifically say so. Most countries, however, report measures on particular aspects of forestry employment.

Employment trends and policies must be considered separately for forest workers and more senior appointments.

6.2. Forest workers

At operational level, mechanization has converted forest work from an unskilled, arduous and badly paid job into a highly skilled and well paid occupation with a corresponding enhancement of social status. Because of the additional training requirements associated with mechanization, some countries (e.g. Finland) report a switch from seasonal to permanent working; this trend has also helped to reduce accidents which have always been a major problem in forestry work.

As already indicated, the rising productivity associated with improved technology leads to a corresponding reduction in the number of people employed. In some countries the reduction has been dramatic. In Finland, employment in forestry dropped from 72,000 man years in 1966/67 to 28,000 man years in 1980/81. Sweden reports: "From 1960 to 1985, the labour input decreased from 0.6 to 0.1 man-days per cubic metre of harvested volume as an average for all logging and silvicultural work. A corresponding modernization and structural concentration took place within the forest industries". In most other countries change has been less dramatic, especially where the maintenance of rural employment is an important policy issue. Cyprus reports: "The threat to forests from certain villages in and near the forests is still so grave as to render imperative the almost continuous employment by the Forest Department of their inhabitants for whom there is rarely any other work". Turkey is another example: "In the 5-year Development Plans and Government Programmes the implementation and support of labour-intensive projects based on assumptions that the most important problems in Turkey are unemployment and inflation have been accepted as targets".

The incentive to innovate and improve the status of forest workers is particularly great where there is a labour shortage as in Bulgaria: "There is a shortage of labour because of a migration to other industries where salaries and working conditions tend to be better". Yugoslavia, however, confirms that better conditions alone may not solve the problem: "Constant difficulties are encountered in recruiting workers, although the work is well paid and free transport to the work-site, hostel type accommodation and meals are provided". The employment situation may differ between one part of a country and another as in Finland: "In remote areas there are many trained and experienced people without forestry employment. On the other hand, in the surroundings of Helsinki, there is a constant shortage of forest workers".

Social security legislation for forest workers is usually linked to the provisions either for agricultural workers or for industrial workers in general. The more important points covered by the laws relate to

rights and duties, discipline, health, safety, recruitment, working hours, paid holidays, wages and other related matters. One of the most complete accounts is given by the GDR: "The employment of people in forestry and wood industry is regulated by the labour code of the GDR. The labour code defines the basic rights of the working people as guaranteed by the Constitution, e.g. the right to work, the right of co-determination, of pay in accordance to quality and quantity of work done, the right of education, of recreation and leisure, of protection of health and working power, of participation in the cultural life, of pension in old age and in case of disablement, and of material security in case of illness or accident. ... The leading principle is the right to work and the orientation towards full-time employment." The general laws are often supplemented by specific rules for forestry. Poland cites rules for "norming and tariffing work, job specifications, determination of unit rates resulting from work done and some aspects of training".

Trade union activities in forestry are rendered difficult by the geographic and organizational dispersal of the labour force. The proportion of workers who are members of trade unions, therefore, tends to be lower than in industries where employment is more concentrated. Sweden and a few other countries have separate trade unions for forest workers. Bulgaria reports that "the workers and employees are organized by forest districts and forest enterprises in an independent trade union". In most countries, however, forest workers are catered for by one or several unions which also include workers from other sectors, especially agriculture.

The remuneration of forest work is determined in various ways. In the centrally planned economies, governments play a major role in fixing wages. Albania reports: "Wages of workers and specialists are based on the socialist principle of remuneration according to work. The maximum salary in all categories of work is twice the minimum salary". Bulgaria reports that "Salaries and social insurance benefits are regulated in accordance with the labour code".

In the market economies, wage rates are generally based on collective agreements between the trade unions and the employers' organizations including the state, but with considerable flexibility in the application of these norms. Luxembourg reports that the hourly rate paid to forest workers is based either on the collective agreement for forest workers employed by the state or on specific agreement between forest owner and the workers employed by him. The rates set by bargaining at national level are often regarded as the minimum rates that are applied in practice. Piece work usually results in significantly higher earnings than payment by time. The choice between these methods of payment has been a policy issue to which one solution has been payment by time linked to output targets.

The most advanced forms of wage negotiation, practised especially in Sweden, looks not only at the immediate future, but also further ahead. The discussions are not confined to wage bargaining alone but also cover the question on how best to achieve continued improvements in productivity. As a result, Sweden can report: "The policy of the Forest Workers' Union mostly has been to support mechanization and rationalization

in return for better wages and more acceptable working conditions, but at the cost of a successive loss of members". Employers and employees thus cooperate in trying to increase the size of the cake instead of merely bargaining about how to divide it.

Policies to provide jobs in forestry for special groups of people have met with mixed results. The difficulties have been highlighted by France: "The forestry sector has regularly been asked to play its part in combating unemployment, delinquency, etc. The sector has accordingly recruited French people of Islamic stock who have been repatriated from North Africa. More recently, the forestry sector has been asked to offer work experience to young people in jobs of public interest. 3,500 young people have thus been employed in forests belonging to the state and communities and another 1,000 in private forests. The scheme has encountered difficulties for various reasons: the work is difficult and without career prospects, it is usually far from locations with other employment opportunities, the types of work for which young people can be used are limited because of the objections of the regular work force".

Some countries, e.g. Greece, are non-commital: "The Forest Service undertook special programmes for the unemployed in 1983, 1984 and 1985, but most of the unemployment programmes are implemented by the Ministry of Labour". Sweden, on the other hand, reports: "Silvicultural operations have offered suitable objects for relief work. In addition to relief work for occasionally unemployed people, forest relief work has also been arranged for elderly forest workers with a decreased working capacity and, to a certain extent, also for individuals with drinking and drug problems". The problem of finding suitable work for elderly workers is likely to spread with further mechanization. The operation of advanced harvesting equipment requires great skill and is highly paid, but the stress is too great beyond a certain age.

Israel refers to the role of forest work in the absorption and training of immigrants. Portugal reports the following sequence of priority for employment measures: the young, the long-term unemployed, women, the handicapped. Portugal is one of the few countries to mention women at all among forest workers in its Country Report although the employment of women is now generally encouraged throughout most of Europe in jobs not requiring great physical strength, e.g. in forest nurseries.

Safety has always been a problem in forestry. Mechanization has eliminated some risks and introduced new ones. In addition to the adoption of relevant legislation which has already been mentioned, many countries have established procedures to keep safety under constant review. Thus in Great Britain: "The Forestry Commission formed a Forestry Safety Council which includes representatives of trade unions and the private sector and which lays down safety standards which are set out in a series of Forestry Industry Safety Guides issued throughout the industry and regarded by the Forestry Commission as the minimum safety requirements".

Some special problems have been reported. France: "Accident insurance for harvesting is extremely high; this results in 'moonlighting'

(travail au noir)". Spain: "Up to now workers employed in the forestry sector have been small woodland owners who have contracted to do this work in addition to their own. Because of unemployment in the building industry, the Administration would like to absorb these unemployed into forestry to the detriment of the small woodland owners, who have responded to this threat by getting themselves registered as unemployed so as to qualify for employment in forestry".

Shortage of funds has curtailed forestry employment: The Netherlands for example reports 7,500 man years of overdue forest maintenance because of the financial situation in forestry.

6.3. Forest managers and specialists

Except in countries with very large forest resources, the employment opportunities for foresters with technical qualifications or a university degree are limited. There usually are far fewer posts than candidates, a point that will be considered further under training. Employment has, however, not dropped as much as it has for forest workers because the effects of rationalization have been partially offset by the new posts that have been created to implement the policies associated with the growing environmental and recreational roles of forests.

The major employer of university graduates of forestry is generally the state. The jobs are concerned with the forestry authority functions and with the management of the state forests. Posts in forest management are also offered by other large forest owners: industries, communities and institutions of various kinds as well as by some private estates. Independent consultants or firms of consultants offer management services to the smaller public and private woodland owners who do not employ their own staff. In Austria, estates with over 1800 ha of forest are obliged to employ a graduate forester and estates over 500 ha must employ a forester with a technical qualification. No other country has reported a similar obligation. Research and teaching also absorbs a significant proportion of forestry graduates. In some countries, forestry graduates find work outside forestry, e.g. in connection with the conservation of nature and landscape. Conversely, a rising proportion of posts in forestry now require expertise in other fields such as civil and mechanical engineering, economics, various branches of biology, soil science, public relations, landscape architecture, law, and even archaeology. Such posts are normally filled by graduates in the appropriate subjects. Forestry organizations thus increasingly operate as interdisciplinary teams. Even in forest management and administration itself, senior posts including the top post are no longer everywhere the preserve of forestry graduates. This competition is healthy if fitness for the post is the criterion for selection. The encroachment, however, raises a number of questions including those concerning the content of university degree courses in forestry and subsequent career development.

Few countries refer to the role of women in senior forestry posts, although most have introduced legislation to terminate sex discrimination against women in most areas of employment, including forestry. The USSR was among the first countries to appoint women to senior managerial posts in forestry.

The employment of forest guards in Europe is confined mainly to forest administrations in the South, e.g. the 'Corpo Forestale' in Italy and the 'Guarderia Forestal' in Spain each with several thousand men. As the name implies, forest guards have the duty to protect forests against illegal actions by man and against damage from other causes, especially fire.

Forest guards may also perform other duties such as measuring timber or supervizing labour. Most countries in Europe, however, regard forest guards as unnecessary or even undesirable in a modern forest administration.

Forestry staff in government employment are usually either civil servants or are treated as such for pay and security of employment, etc. That also applies where the state forests are managed on commercial lines as a state forest enterprise. Other employers have until recently tended to offer conditions of employment not very different from those of the state but there appears to be a gradual move towards practices which are customary in industry such as performance-related pay combined with a reduction in job security.

Overseas employment continues to attract European forestry graduates who participate in the work of international organizations or in bilateral aid projects. Most of the assignments are in developing countries and for limited periods rarely exceeding 5 years. Some governments have a policy of releasing forestry officers to undertake such work without loss of their right to subsequent re-employment at home. This type of arrangement is in everybody's interest. The forestry officers can widen their professional horizon without jeopardizing their career prospects, the developing countries are assured of competent and experienced advisers when and where they are needed and the European forestry administrations benefit when the returning officers tackle old problems with a fresh mind and new ideas. Personnel problems may of course arise if there are too many temporary releases and if the whole system is not carefully planned and monitored on a long-term basis.

The organizations representing the interests of professional foresters vary greatly from country to country. A common arrangement is to have special staff associations for forestry staff in public service. These staff associations sometimes cater also for professionals and technicians in other fields. These staff associations are usually separate from the forestry societies which are primarily concerned with the technical and policy aspects of forestry; and they are generally open to the whole forestry profession irrespective of employment and, in some instances, also to others with a forestry interest. The diversity of membership and objectives of the various associations can make it difficult for

associations from different countries to find much common ground when they meet.

Much of what has been said about university graduates of forestry also applies to foresters with qualifications at technical level; indeed, in some countries the distinction is becoming somewhat blurred. This is due to the rising standard of training at technical level which creates opportunities for subsequent promotion to posts which had previously been reserved to university graduates. In the UK, the trend has gone so far that posts at technical level are not even mentioned in the Country Report: "The Forestry Commission employs forest officers who undertake professional forest management and advisory duties, and forest workers who perform manual duties such as tree planting and timber harvesting". One significant area of employment from which foresters with qualifications at technical level normally continue to be virtually excluded is in development aid, because developing countries tend to take the view that only people with high academic qualifications can be relied upon to give good advice. This belief is, of course, a fallacy anywhere in the world, including Europe.

6.4. Policy trends in personnel management

Policies relating to personnel management range from exemplary to almost non-existent. There is room for improvement everywhere and the following trends which have been noted by some countries merit universal support:

- helping all who work in forestry to develop their full potential by means of coherent programmes of refresher courses, conferences, study leave, opportunities for specialist training etc.;

- linked with the above, improved facilities for upward mobility from the level of skilled worker to technical and senior posts in forest management and administration;

- constant review of technologies and working practices in order to promote individual efficiency and facilitate organizational improvements;

- greater use of interdisciplinary teams to counteract the effects of inevitable trends towards specialization;

- improved employment opportunities at all levels for women;

- greater staff participation in management decision through the creation or improvement of consultative procedures;

more attention, where practicable, to the needs and preferences of personnel and their families in matters such as transfers from one duty station to another.

7 EDUCATION AND TRAINING

7.1. General considerations

In the Country Reports as well as elsewhere, the words "education" and "training" are frequently treated as synonyms, although there is an important difference which lies more in the purpose of instruction than in its content. Education promotes the general development of body, mind and character, while training prepares a person for a particular activity. The distinction between education and training is of more than academic significance because, in forestry as in other walks of life, better education at all levels is the key to progress. Indeed, training in the application of new advanced technologies presupposes an adequate level of general education. This is now widely recognized, especially in the countries where forestry is most advanced.

In practice, most instruction has both an educational and a training element, but the emphasis differs. Thus instruction in the use of chain saws is training because the main purpose is to enable people to use these tools. A forestry course at a university on the other hand is education because, in addition to imparting knowledge, it helps to develop a student's faculties of observation, reasoning, problem solving and communication which are equally useful in other walks of life, a point that has been borne out by the forestry graduates who have succeeded in other careers. The educational and training objectives tend to be more or less evenly balanced at the technical level of instruction which is, however, generally referred to as training.

In Europe, as elsewhere, three principal levels of instruction are widely recognized both in forestry and in forest industry:

- university or equivalent level courses for those who aspire to senior administrative, managerial and specialist posts;

- technical level courses to qualify for jobs in middle management and equivalent specialist posts; some countries, e.g. the FRG, distinguish between technical training at higher and medium level;

- vocational courses leading to a qualification as a skilled forest worker.

Policies to raise the standards of education and training at all levels can and should also facilitate upward mobility from skilled worker to technician and from technician to professional forestry officer or forest engineer. Special provision is sometimes made for instruction in subjects such as forest engineering. The three tier system of instruction is exemplified by Bulgaria, Poland and Sweden.

Bulgaria: "Engineers specialized in forestry and wood processing receive their training at the Higher Institute of Silviculture, which also has a Department of Landscape Architecture. For chemical wood processing, engineers are trained at the Institute of Chemical Technology. Both institutes are located at Sofia. The courses at each institute last for 4-5 years. To meet the demand for technicians

and skilled workers, there are 9 intermediate technical schools ("Technicum") and 10 vocationaal technical schools; there are also 30 professional centres with 18 sub-units for the training of qualified workers".

Poland: "Two agricultural universities have separate faculties of forestry and wood technology. A third, in Cracow, has only a forestry faculty. Special forestry colleges and wood industry colleges deal with the education of the staff for supervisory posts at technical level. Forestry workers receive their training at enterprise schools and on educational courses. Both institutions enable them to get the title of qualified worker on the same basis as workers in other sectors of the national economy. This well-developed system of higher, medium and basic education satisfies almost all needs".

Sweden: "The forestry education system may be summarized as follows:-

Forest workers: After 9 years of compulsory comprehensive schooling, it is possible for a student to pass a special course in forestry of 40 weeks duration which gives basic training in forest work with special emphasis on work safety.

Forest technicians: A degree in forest technology may be obtained at one of three Forestry Institutes. A future technician has a basic and occupational education which amounts to 13 years in total. In addition, one year of vocational training is compulsory as an entrance qualification to the Forest Institutes.

Forest officers: The Faculty of Forestry provides a basic degree in forestry after 4½ years of university studies. It is a general rule in Sweden that universities should be open to everyone with certain general qualifications for university studies, regardless of previous formal education."

Throughout Europe, the state plays a dominant role in forestry education and training at all levels. In the centrally planned economies there are virtually no facilities other than those provided and controlled by the state and also in the countries with market economies most universities and other teaching centres are either under direct state control or dependent on the state for finance and as a major employer of those who qualify, but there are exceptions.

Thus, in Finland: "Private enterprises organize education and training on their own; typical are short courses dealing with changes in production operations". The Netherlands provides another example: "The links between training and practice will be strengthened through the financial participation of the commercial world in university education".

In forest industry, the role of the state in education and training, while significant, is not as great as in forestry. Thus, in Finland, the educational and research programmes of the Department of Forest Products of the Helsinki University of Technology are closely related to the main activities of the Finnish national economy. This is reflected in the fact that "most often the M.Sc. thesis is based upon a concrete industrial

problem, the basic research work being carried out in industry". In Portugal, to quote another example, there is a centre for professional training for the timber industries in which the National Association of Sawmillers and the Federation of Trade Unions for Sawmilling and Joinery participate; also the pulp industries in Portugal have systematic programmes of training and refresher courses for their employees at all levels.

The need for refresher courses is not only stressed by Portugal, but also by a number of other countries, for example:

Bulgaria: "A special centre for refresher courses for managers has been established in order to raise standards. About 200 engineers from the various branches of forestry and forest industry participate each year in the courses which normally last for 45 days".

GDR: "Further education for university and technical college graduates is organized through special courses run every five years."

Ireland: "The objective of continuing education is to keep technical and professional staff abreast of developments in forestry. The orientation of these courses is towards staff employed in the state forest sector. However, private forestry personnel are tending to be included in these courses as participants in specialized aspects of forestry operations".

Switzerland: "There is a need to maintain professional standards at all levels by means of refresher courses. At present, such courses are offered by a variety of organizations, especially the cantonal forest services, the technical schools and the Federal Forest Service. What is missing is an overall framework to ensure that all needs are met efficiently and on a continuing basis. Proposals to meet this objective are at present being worked out by a working group set up by the Conference of Cantonal Inspectors and the Federal Forest Service".

Yugoslavia: "Life-long education is a constant practice in forestry and the wood processing industry. It is carried out at faculties and education centres; professional associations and work organizations also play a part".

Needless to say, refresher courses are an essential complement to, but not a substitute for, individual effort to keep oneself informed of relevant new developments.

The links between forestry and related subjects are strongest at universities where forestry students and students of other faculties attend the same lectures on subjects which they have in common; this point will be considered further under university level education. At technical and vocational level, the links are generally less close and in many cases instruction is quite separate. There is, however, a trend in some countries, e.g. Finland and the FRG, to put an end to this isolation. Finland: "The general upper secondary schools and vocational institutions are developed as parallel educational routes to occupational competence at all levels from skilled forest worker to forest engineer. The objectives

are to provide every person with an equal opportunity to enable him/her to continue studies without interruption from one type of school or level of eduction to another". FRG: "Until very recently, the technical training of foresters at upper and medium levels took place at the forestry schools run by the forestry services of the Länder. There is now a tendency for this training to be moved from these forestry services to colleges for higher professional training ("Fachhochschulen"). Three institutions of that type already exist".

Additional points with policy implications to which attention has been drawn in Country Reports include the following:-

- Physical fitness: in the FRG, "because of the special characteristics of the forestry field service, the applicant has to submit a medical health certificate before starting his practical training, certifying that his eyesight and hearing are good and that he is able to distinguish colours".

- Urban background of students and trainees: more and more young people who wish to take up a forestry career have grown up in towns; their unfamiliarity with life in the country cannot be ignored either in the selection of candidates for courses or in the content of the courses; insistance on a period of practical forestry work as a condition of acceptance for a course has in some instances provided a satisfactory solution to this as well as to some other problems.

- Teaching skills: at all levels of instruction - university, technical, vocational - the standard of teaching often leaves much to be desired: educators and trainers must be taught how to teach.

Some additional problems and policies relating to a particular level or category of instruction must now be considered.

7.2 Courses at university level

Courses in forestry at university level are given at universities, at higher technological institutions such as the Eidgenössische Technische Hochschule at Zürich in Switzerland and at special institutions such as the Ecole Nationale du Genie Rural Française (ENGREF) at Nancy in France. At universities the arrangements differ widely; they include: a separate faculty of forestry, a combined faculty of agriculture or environment and forestry, a combined faculty of forestry and forest industry, and forestry as a specialization within a larger faculty (e.g. Belgium, Netherlands, Portugal). The Oxford Forestry Institute is an example of a university institution where forestry is limited to postgraduate studies.

One of the most striking features about university level education in forestry is its concentration in some countries and its dispersion in others. At one extreme, there is Sweden with over 20M ha of forest and a single faculty of forestry and, at the other extreme, there is Belgium with less than one million ha of forest and four universities with courses that lead to a forestry degree. Not surprisingly, Cyprus, Israel and Luxembourg with their very limited forest resources have no university level courses in forestry at all.

University level teaching of forestry has undergone and is continuing to undergo changes which are brought about by:

- the widening scope of forestry which has resulted from the greater emphasis on the environmental and social aspects of the profession;

- the rapid progress in technology which is likely to continue;

- more varied employment opportunities: in most countries, the state and other public authorities continue to present the main employment opportunities for forestry graduates, but the number of appointments outside the public service is steadily increasing; in the extreme case of Finland, the proportion of forestry graduates employed outside public administration has risen to some 80%;.

- the need for an interdisciplinary and even intersectoral approach to many forestry problems, an approach which should already be encouraged at university.

The responses to these factors have varied and continue to be the topic of discussion and controversy, but some trends are discernable:-

(1) Preference for a general scientific and technological education before any specialization in forestry or wood technology; this system makes it easier for students to adapt to new techniques and job requirements and also prevents a syllabus from being overloaded with technical detail which will in any case soon be overtaken by events; moreover, it permits forestry students to share part of their instruction with students in related disciplines.

(2) Greater flexibility and more subject options, particularly during the later stages of a university course.

(3) Greater emphasis on case studies that require an interdisciplinary approach.

Courses that follow these trends are now widely regarded not only as the best preparation for a forestry career but also as a good education for 'high fliers' who are capable of reaching top posts in other walks of life. Moreover, 'high fliers' are more likely to be attracted to this type of course than to a purely vocational one.

Largely for historical reasons, forestry is seen as either a branch of applied biology or as a branch of engineering. The university degrees are accordingly awarded either in forestry (e.g. FRG, UK) or in forest engineering (e.g. Austria, Switzerland).

The influence of the state on forestry teaching has already been mentioned. In some countries, the syllabus is fixed by the state or even prescribed by law (e.g. Spain). Elsewhere, the state exercises its influence more indirectly by holding the purse strings and by issuing general guidelines. In much of Europe, academic freedom continues to be cherished as a bastion of civilization which is stoutly defended against excessive intrusions by the state.

The duration of university courses leading to a forestry degree is usually 4 to 5 years.

Acceptance for a forestry course at a university (or equivalent) is much easier in some countries than in others. In Italy, for example, entry is open to everybody who has passed the appropriate examinations in general secondary education. This system often leads to a serious "over supply" of graduates. At the other extreme, there are countries where the annual intake of students is fixed by the state and/or university authorities in accordance with the expected future demand for qualified personnel. In most countries, however, systems are applied which lie between these extremes. Some universities insist on practical work experience of anything up to one year as an additional entry requirement. The experience is regarded as desirable in itself and is also intended to deter unsuitable candidates. In Sweden, as already indicated, academic requirements for acceptance to the degree course in forestry may be relaxed in the case of candidates with suitable practical experience.

The desirability of close links between education, research and information has been stressed by the Netherlands where these links have proved their worth in agriculture and are now to be strengthened also in forestry.

Most university faculties that offer degree courses in forestry also provide opportunities for postgraduate studies leading to doctorates or other postgraduate qualifications. These additional qualifications are generally of more benefit to those who wish to embark on a career in research or university teaching than to prospective forest managers or administrators.

Many students from develping countries attend forestry courses at European universities. The choice is determined largely by linguistic and political affinities. Thus most of the foreign students in the UK come from anglophone countries, those in France from francophone countries and those at universities in countries with centrally planned economies from countries with similar economic systems. Special provisions for instruction in the language of the university are made wherever necessary. In Finland, however, foreign students may, in certain circumstances, be taught in English.

Forestry faculties in Europe have helped universities in developing countries to establish and maintain forestry faculties e.g. by providing lecturers and external examiners. International organizations such as FAO have played a leading role in the establishment and strengthening of such faculties.

The policy of assisting developing countries to become less dependent on foreign universities must be welcomed; it has achieved promising results in countries with the requisite educational, social and economic infrastructures.

7.3. Instruction at technical level

There is a great discrepancy between countries in the standard of

forestry training at intermediate or technical level. The high standard in much of Europe contrasts with the virtual absence of any systematic training in other countries a few of which are taking steps to remedy the deficiency.

The courses generally last 2 to 3 years. Entry requirements include some secondary education and, in most instances, some prior practical work experience. Some establishments also require the prior qualification as a skilled forest worker.

Where more than one level of technical training is offered, there is a danger for the upper level to concentrate too much on theory and too little on practice with the result that second class forestry officers are turned out instead of first class foresters and technicians.

Most training at technical level is for local students but the Cyprus Forestry College is not only open to students from abroad but gives all instruction in English for their benefit.

7.4. Forest workers' training

Also the training of forest workers ranges from very good to virtually non-existent. A few countries did not even mention the topic. Formal courses of up to 3 years to train skilled forest workers are reported for Czechoslovakia, Denmark and the FRG. Most other countries with formal arrangements have shorter courses of about one year or slightly less. The Netherlands reports an apprentice system and Switzerland "a combination of apprenticeships within the enterprise and theoretical and practical courses at the School of Wood Technology at Bienne". In Yugoslavia, "forest workers must have received elementary education (8 years) and have attended professional courses (from 6 to 12 months) organized by the appropriate secondary schools".

Short courses lasting anything from a few days to a few weeks are organized in several countries for seasonal and part-time forest workers and especially for small farmers who own woodlands. The UK reports "part-time study for those forest workers who demonstrate ability and aptitude for work at technical/supervisory level".

7.5 Forestry instruction in general education and for the general public

Forestry instruction at schools appears to have been taken farthest in Yugoslavia which reports: "Great attention is devoted to forestry in general education. It starts at primary school and is developed through various drives such as 'landscaping school grounds', 'days of forests', 'weeks of forests', etc. Through organizations such as Young Nature Lovers, Friends of Forests, horticultural societies, etc. young people organize drives for voluntary afforestation and other work in forests".

Forestry at schools is, however, more commonly dealt with, as in the UK, "in general subjects such as geography, botany, biology and environmental studies but it does not constitute a separate subject". This inclusion of forestry in teaching is assisted if, as in Albania, "information to promote a better understanding of forestry is supplied to all schools". The success of these various efforts obviously depends much on the enthusiasm and ability of the teachers.

The most effective ways of promoting a love and understanding of forests and nature in general among the general public appear to be associated with the provision of recreational facilities such as nature trails, guided walks, information centres, picnic sites and so on. Experts in public relations as well as forestry are required for best effect. Expertise in public relations has proved to be even more essential when television and the press is used to inform the public about forestry. However valid and important the message, it inevitably falls on deaf ears unless it is well presented in language and with visual aids that appeal to the public. That is something that many forestry services have yet to learn.

7.6. Summary of trends

Overall, the situation in forestry education and training may be summarized as follows:-

(1) In all countries, there is a need for constant evolution of the whole education and training system for forestry if the system is to be kept up to date.

(2) Forestry education at university level is generally of a high standard but in some countries it could be made more effective at less cost by being concentrated at fewer universities; in some other countries university courses in forestry continue to be too bound by tradition and without sufficient links with other disciplines. The general trend towards greater emphasis on scientific principles and less on technical detail is to be welcomed.

(3) At technical level, forestry training is very highly developed in some countries, while others have little or no such training; unless they remedy this deficiency, the application of new technology to practice will be seriously retarded.

(4) Also in the training of forest workers there are great discrepancies in standards between countries; some countries do not even seem to appreciate that this training is essential in the interests of the workers as well as of forestry.

(5) No clear impression emerges about the attention paid to forestry in general education, but in most countries a serious effort is being made to promote a better understanding of forestry among the general public.

(6) In forestry education and training, the countries of Europe could learn much from each other, perhaps more than in any other aspect of forestry.

8. RESEARCH

8.1. History

The hallmark of a sound research policy lies in the anticipation of needs instead of in a mere response to problems as they arise. This principle applies especially to forestry where the lead time for research to bear fruit can be very long. While the importance of research in forestry and wood technology is now generally recognized, some national research policies are not sufficiently forward looking. Indeed, a useful first step to put matters right might be to examine which lines of research have outlived their original purpose and might be discontinued.

To put the priorities and the problems of organization, funding and technology transfer into perspective, the changes that have taken place in the content and scope of the research must be considered. For forestry, Hummel has summarized these changes as follows in Forest Policy, a Contribution to Resource Management. (Martinus Nijhoff/Dr. W. Junk Publishers, The Hague, 1984):-

> "When forest research began in Europe in the 19th century, it was confined mainly to questions of silviculture and management: how to secure a regular and if possible rising yield, how to protect the forest against pests and fire, and how to enable forests to reduce or prevent erosion. The emphasis was on improving the natural forest. A new era of research opened when foresters started to do what farmers have done for many centuries, namely introduce exotic tree species and breed more efficient varieties to achieve their objectives. A further new dimension was added to forest research by environmental and social forestry and the recognition that timber is only part of the renewable biomass produced by trees. The mechanization of forest operations and especially of the harvest and transport of timber also introduced additional research disciplines. These trends have immensely widened the scope of forest research, shifted a significant proportion of it from the forest to the laboratory and brought it into closer contact with many other fields of research, ranging from biochemistry and genetics to ergonomics, engineering, and landscape design. There are now also forestry components in many other fields of research".

Research and development in wood technology has similarly expanded in scope and content and must continue to do so, if wood is to remain competitive as a raw material.

8.2. Research areas

The main areas of forestry and forest products research are as follows:-

1. Biological: silviculture and tree breeding including choice of tree species, selection of origins and of individual trees for the breeding of improved strains and clones; fertilization; studies of growth and yield; protection against abiotic and biotic damage.

2. Environmental: protection of the environment including soil and water conservation, wildlife management including hunting.

3. Technological: mechanization of forestry operations including the harvesting and transport of timber, forest road construction, etc.

4. Social: safety and health of forest workers: the role of forestry in promoting the well being of rural populations.

5. Economic: the application of economics to forest management and the marketing of forest produce.

6. Recreational use of forests.

7. Links with other forms of land use: agroforestry, etc.

8. Study of wood properties as a guide to utilization on the one hand and to silviculture on the other.

9. Mechanical processing as in sawmilling, particle board and plywood manufacture.

10. Conversion to fibre as in the manufacture of fibre-board, pulp and paper.

11. Use as a source of energy, either by direct combusion or via transformation into fuels such as methanol.

12. Use as a chemical feedstock for the manufacture of a wide range of chemicals.

13. Research connected with the cultivation and utilization of cork, resin, essential oils and a host of other forest products which are of local importance.

Some of the above problems cannot be solved by research alone. Administrative decisions, common sense, practical experience of forest managers based on trial and error also play a part especially in the solution of the social problems, but even here progress will be retarded without adequate research.

8.3. Priorities

Only a few countries have given a clear indication of their policy priorities for forestry research; they include the following:-

Albania: "The main objective of the research is to increase the productivity of the forests".

Bulgaria: "Recently, particular attention has been devoted to questions of the environment in collaboration with the Permanent Commission for Nature Conservation and other relevant bodies".

France: "The basic objective is to promote at minimum cost, the production of wood (in quality and quantity) while assuring the permanence of the ecosystems and without prejudice to the other forest functions, especially recreation and protection".

Poland: "Scientific and research activities are mainly directed towards forest conservation, multi-use of forests and optimization of forest raw material utilization".

At the other extreme, there are two countries which draw attention to the absence of a national policy for forest research:

Finland: "There has been no general forestry research policy. However, in the very near future, there will be a forest research committee with representatives from most research institutes working together with the key persons of forestry policy and of practical forestry. Its main task will be to develop an integrated forestry research policy".

Italy: "Up to now research has been conducted at a large number of centres, by different institutions and with diverse objectives. Individual research projects are often excellent, but forest research as a whole suffers from the dispersion of initiatives, the heterogeneity of intentions, the fragmentation of effort (also in financial terms) and lack of technology transfer".

Among the countries that did not comment on research priorities as such, there are a few which have indicated how priorities are determined in practice:-

Hungary: "Forestry research is coordinated by the Forestry Committee of the Hungarian Academy of Sciences. This Committee determines the main directions and priorities of research in conformity with forestry policy".

Netherlands: "There already exists a framework for the research programme to which all the institutions in forestry and commercial forestry can make a contribution. Through discussion structures the attunement of research and practice will be improved in the coming years".

Turkey: "The various interests concerned with the application of research results are consulted on the formulation of research programmes at annual meetings covered by the Research Institute Council.

Also some other countries which have not specifically referred to the matter are known to have formal or informal arrangements for deciding and reviewing research priorities. Such arrangements can combine a desirable degree of flexibility and response to changing requirements with a research strategy that is reasonably coherent while taking account of the fact that different research institutions have different priorities. Thus research institutes of forestry administrations are concerned mainly with applied research of maximum immediate benefit to forest management, while universities and other academic institutions will tend to concentrate more on fundamental research that leads to a better understanding of nature. At universities, the educational objectives of doing research are of particular importance. A coherent national research policy embraces

applied and fundamental research so that they may complement one another.

8.4. Organization and funding

A distinction must be drawn between forestry research and forest products research.

8.4.1. Forestry research

Most forestry research throughout Europe is funded by the state and is undertaken by:

- government research establishments directly responsible to the forestry authority or to a ministry;
- universities;
- acadamies of science and various other scientific institutions whose main field of interest lies outside forestry;
- other research institutes.

Government research establishments may embrace both agriculture and forestry (e.g. INRA in France or INIA in Spain) or they may be for forestry alone, in which case they usually come either directly under the national forestry authority (e.g. some states of the FRG, UK, Ireland) or they are more indirectly connected with the forestry authority by coming under the same ministry (e.g. Austria, CSSR, Denmark, Finland, Norway).

Close organizational links between national forestry authority and forestry research institutes facilitate - but cannot guarantee:

- a sensible allocation of priorities for applied research,
- close contacts and even transfers between research and field staff,
- the feedback of experience and problems from the field,
- dissemination of research results to forestry practice,
- availability of sites for experiments in state forests.

An example of a special link between forestry research and state forestry is provided by the GDR where the Institute of Forest Sciences at Eberswalde has affiliated to it a State forest enterprise with 45,000 ha.

Close organizational links between agricultural and forestry research, on the other hand, can help to prevent forestry research from becoming too inward looking and isolated from the mainstream of developments, e.g. in biotechnology; the links also facilitate the solution of common problems as in agroforestry or the study of soils, but there are also certain risks: apart from the loss of the direct link with forestry practice, forestry research may receive insufficient attention and funds in a research establishment of which it constitutes only a minor component.

Universities at which forestry is taught usually also undertake some research, but the amount varies greatly. Sweden reports that "around 85%

of the budget of the Faculty of Forestry [at the Swedish University of Agricultural Sciences] is spent on research and around 15% on education". Elsewhere, there is more emphasis on teaching and less on research. As already mentioned, universities usually attach great importance to educational objectives in their research programmes.

Where universities are also intended to serve the research requirements of forest management, it is not always easy to ensure that these requirements are met because of conflict of interests between applied research and academic freedom. In fact, there are instances (not reported in the Country Reports) where this conflict of interests has led to the abandonment of the arrangement.

Acadamies of Science play a prominent role in forestry research, e.g. in Bulgaria which reports: "The Institute of Forestry Research and Experimentation [founded in 1942] is an independent body for scientific research within the system of the Academy of Sciences. It continues the traditions of its predecessors in forestry research". In Hungary, as already mentioned, the Forestry Committee of the Academy of Sciences is responsible for the coordination of forestry research.

Other research institutes that undertake forestry research are mainly of two kinds:

- institutes that concentrate on a particular aspect of forestry and are sometimes financed wholly or in part by forest industries: e.g.:

  . institutes that specialize in the cultivation of poplars and other fast growing species: Geraardsbergen (Belgium), AFOCEL (France), Casale Monferrato (Italy);
  . institutes that specialize in harvesting methods and machines: ARMEF (France);

- institutes concerned with research on nature conservation, game management, hydrology, etc., may include a forestry element in their activities. Forestry research which is associated with other disciplines must not neglect its close links with the main stream of forestry research if it is to be effective.

8.4.2. Forest products research

The role of the state in forest products research continues to be important throughout Europe but, in the countries with market economies, the role is not as great as it is for forestry research. The link with forestry research lies principally in the study of wood properties which are influenced by silviculture and in turn influence wood processing and the quality of wood products.

The responsibilities at government level for forestry and forest products research normally rests with different ministries, because the research links between wood and other materials are considered to be stronger than those between forestry and wood. That explains why forestry research and forest products research are usually carried out at separate

establishments; an exception is the Federal Research Establishment for Forestry and Forest Products (Bundesforschungsanstalt fur Forst-und Holzwirtschaft) near Hamburg in the FRG. This establishment consists of several institutes concerned with various aspects of forestry and forest products research; each institute has a certain degree of autonomy, but all are on the same campus and under the same general direction.

Forest products research is carried out at:

- special establishments devoted mainly or exclusively to research in wood processing and/or forest products; these establishments are either managed and financed by the state or by industry or by a combination of both;

- universities;

- various research establishments where wood is of interest in another context, e.g. the Building Research Laboratory in the UK.

The wide range of national arrangements is best illustrated by examples quoted or abstracted from the Country Reports:-

Finland: "Research in wood science is mainly carried out by two state subsidized institutions: the Technical Research Centre of Finland and the Helsinki University of Technology. A few other universities of technology also deal with forest industries, mainly from a viewpoint of processing techniques. The most significant private establishment is the Finnish Pulp and Paper Research Institute."

France: Two centres are mentioned:

- le centre technique du bois et de l'ameublement (CTBA);
- le centre technique des industries des papiers, cartons et celluloses (CTP).

Hungary: "Basic timber research is carried out mainly at the University for Forestry and Timber Industry, applied research at the Research Institute for the Wood Industry which has achieved significant results in the development of particle board and fibreboard manufacturing technology as well as in the consumption of domestic hardwood by the building sector."

Ireland: "The Timber Products Department of the Institue for Industrial Research and Standards (IIRS) carries out research under contract on the properties, characteristics and usages of Irish timber".

Spain: The responsibility for forest products research within the Central Administration rests with the "Instituto Nacional de Investigaciones Agrarias" (INIA), which is an autonomous body of the Ministry of Agriculture, Fisheries and Food and also covers forestry reearch. The units in INIA which are primarily concerned with forest products are: cellulose and extractive industries (e.g. extraction of essential oils from eucalypts and other relevant species). The research departments for wood and cellulose are in close contact with other

ministries on such matters as establishing technical norms for specified products.

Sweden: Forestry and forest products research is centred mainly at the Swedish University of Agricultural Sciences, but there are also so-called branch research institutes within the forest industry sector, namely the Swedish Forest Products Research Laboratory and the Wood Technology Centre. At the Stockholm Institute of Technology for the education of professional engineers there is a Department of Wood Technology. The highly developed pulp and paper industries also have their internal research capacities.

Switzerland: "The main institutions concerned with wood research are: the faculties of wood technology and timber construction at the Federal Polytechnic Institutes at Zürich and Lausanne and the wood section of the Federal Laboratory for Material Testing and the Research Institute for Industry, Civil Engineering and Structures. Several national research programmes under the aegis of the National Swiss Foundation for Scientific Research have included research connected directly or indirectly with forestry and wood technology, e.g. with the problems of regional development in Switzerland....."

Yugoslavia: "Forestry faculties are the leading force in the field of scientific research in forestry and the timber industry. Concurrently with the development of scientific research at faculties, a broad network of scientific research institutions has developed in Yugoslavia, specialised in various types of activities in the field of forestry and the timber products industry. In addition to scientific research as its main activity, these institutions deal with designing and executing projects and the transfer of know-how and technology. Some forestry institutes have set up departments for the timber industry".

8.5. Technology transfer

The statements made in the Country Reports about technology transfer are mostly couched in very general terms so that no clear picture emerges. The principal practices mentioned are:

- scientific monographs and articles in learned journals for the benefit of experts;

- more general and concise presentations of research results to offer guidance to the practitioners; in this context, the French Country Report points to the need to take account of the fact that outside the state forests only a minority of forest managers are qualified in forestry; the Report also rightly stresses that the economics of applying new methods must be clearly stated in any dissemination of research results;

- lectures and seminars combined, where appropriate, with visits to research establishments;

- demonstrations in the forest and at forestry and forest products research establishments.

As already stated, technology transfer is facilitated when research and practice are closely linked as when a forestry or forest industrial enterprise has its own research capability. Such links also promote a fruitful feedback of ideas and problems from practice to research.

A crucial point barely touched upon in any of the Country Reports is the vital role of pilot projects in bridging the gap between the achievement of research results and their full scale application to practice. The omission of mention suggests that pilot projects deserve far more attention than they receive at present.

8.6. Conclusions

8.6.1. Forestry research

Research needs in forestry are complex and will continue to vary from country to country, but there are some problems of almost universal relevance which raise serious policy issues. They include the following:-

(1) Forest decline:

The continued uncertainty about the exact interaction of the factors which cause the phenomenon of forest decline casts a shadow over the whole future of European forestry. Research is needed to:

- establish a better understanding of the phenomenon and thus to reduce the uncertainty about its future development,

- devise measures to counteract further deterioration where it has occurred.

(2) Tree breeding:

The application of modern biotechnology to forestry has started to bring about major changes in the genetic constitution of Europe's forests. Controlled breeding combined with vegetative propagation through cloning or micropropagation can bring about great improvements in production, wood quality and resistance to disease, but these developments also lead to a narrowing of the genetic base of new plantations. The policy issue is to take advantage of modern biotechnology without endangering the rich genetic diversity of the tree species in our forests.

(3) Economics:

The methods of economic analysis in forestry need to be improved and refined and there is an even greater need for the wider application of the methods that are already available:-

- At macroeconomic level there is much general discussion in many countries about the social costs and benefits associated with forestry, but very little serious analysis. A common excuse is that some social costs and benefits cannot be quantified and expressed in money terms. That is of course true, but the attempts that have been made have at least dispelled part of the fog surrounding the subject and have gone some way towards clarifying the likely consequences of policy options concerning forestry. However, much work remains to be done.

- In forest management, economic studies should be used more widely to assist in the identification of the most cost-effective treatments.

- In applied research, greater attention to economic considerations would facilitate the identification of research priorities and the evaluation of research results for forestry practice; in fundamental research, economic considerations are, of course, less relevant.

8.6.2. Wood technology research

Wood research appears to be more unevenly spread in Europe than forestry research. Countries that lag behind would do well to consider how best to catch up, if their forest industries and their forests are to remain economically viable. To some extent, countries may be able to draw on the experience of neighbours but, because of their more immediate commercial value, results of research in wood technology are more likely to be treated as confidential than the results of forestry research.

The weakest forest industry in much of Europe continues to be the sawmilling industry which, in many countries, is both highly fragmented and out of date. Rationalization and modernization will, however, only depend to a limited extent on research.

Overall, the two most important general policy objectives in wood technology appear to be:

- to ensure that wood and the industries that process it remain competitive; this means
  - . developing new products, including the use of wood in combination with other materials,
  - . improving the quality of existing products,
  - . reducing processing costs through rationalization and better use of the raw material (e.g. by developing high yielding pulping processes);
- to improve the environmental acceptability of wood processing industries by reducing the associated pollution and health hazards.

These objectives cannot be achieved by research alone, but they cannot be achieved without research.

8.6.3. Organization

Much forestry research is dispersed among a host of small research establishments and two countries have actually commented on the lack of a coherent national policy. It is easy enough to point to the disadvantages of such a fragmentation of effort, but less easy to propose a remedy bearing in mind that the causes are rooted partly in history and in the recent revival of trends towards decentralization, and partly in the large numbers of state, academic and industrial bodies with an interest in forestry and forest industry. It is also worth remembering that in research not all duplication of effort is wasteful because, if two organizations tackle a problem by different methods, one organization may achieve much better results than the other. Moreover, some very small research establishments have produced outstanding results in special fields such as the breeding of poplars. As already mentioned, some countries have introduced formal or informal consultations at national level in order to counteract the disadvantages of dispersal of research effort. The provision of financial incentives to promote closer communication and cooperation between research institutes may also help. This has been demonstrated by some of the research programmes of the European Community in which the funding of projects is made subject to the collaboration of several research institutes from one or more countries.

8.6.4. Technology transfer

In many countries the transfer of research results to forestry practice is far from satisfactory. The difficulties encountered include the following:-

- Because of the fragmentation of forest ownership there are very many potential users of research results, a considerable proportion of whom only have a limited knowledge of forestry.

- In state forests difficulties may arise if the responsibility for research is divorced from the management of the state forests.

- Judging when the time is ripe for technology transfer is not always easy; for example, experience has shown that exotic species which have shown great promise may succumb to pests or diseases or to exceptional weather conditions which only recur infrequently; the trials of various Eucalyptus species in France and Italy which were virtually wiped out by the severe winter of 1985/86 are a case in point.

- The transfer may have to be preceded by large pilot schemes; this is illustrated by the present status of short rotation energy plantations; small trial plots of less than one ha have shown what species to grow and how to grow them, but harvesting machines and

methods can only be developed and tested on much larger areas.

The introduction of new practices may require the training of operators as well as health and safety precautions; that applies especially to the use of herbicides and pesticides and of new harvesting equipment.

In some instances, new practices may only be justified economically if they are introduced on a large scale; thus, the introduction of an exotic tree species is only worthwhile if, either its wood is similar to species for which a market already exists, or if the new species is planted on a sufficient scale to create a new market as was the case with the eucalypts in Portugal and Spain, which gave rise to thriving pulp industries.

In wood technology, the transfer to practice is facilitated because there are fewer potential users and because many of the larger forest industrial enterprises either have a research capacity of their own or contribute financially to the research carried out elsewhere. The contacts between research and practice are therefore generally close. On the other hand, the pilot phase of technology transfer, which is normally essential in forest industry, may involve the investment of substantial sums of high risk capital.

The individual policy measures which are best suited to deal with the above problems will vary according to circumstances but are likely to have the following points in common:-

(1) The responsibility for technology transfer must be clearly defined at each research institute for forestry and wood technology as well as within the government forestry authority and the ministry responsible for forest industries. Keeping the question of technology transfer under constant review at each centre may be facilitated if a particular senior officer is entrusted with this task either full time or part time.

(2) A useful aid to technology transfer is the inclusion in each major research report of a brief statement indicating the implications, if any, of the research results for practice.

(3) There must be a clear recognition that technology transfer involves two kinds of action:

- the solution of technical and managerial problems via large scale trials, pilot schemes, etc.;

- extension work comprising publications, field demonstrations, training in the use of new technology and of any necessary safety precautions; to be effective, these various methods of extension must be used in a coordinated way as part of a coherent strategy.

9 INTERNATIONAL COOPERATION

9.1 Introduction

In forestry, there is a general willingness by all concerned to cooperate internationally. The following are among the reasons for this happy state of affairs: differences in political systems impinge only marginally on forestry, virtually no state secrets and only very few commercial secrets are involved, and there are many common interests which far outweigh the rivalries that occur on questions such as development cooperation with third world countries. Despite the willingness to cooperate, however, information on significant new developments in forestry practice is often slow in reaching forest managers in other countries. That is one of the problems to be discussed in this chapter.

In wood technology, the attitudes towards international cooperation are also friendly but necessarily more cautious because of the industrial and commercial interests at stake which have to be safeguarded.

The founding of the International Union of Forestry Research Organizations (IUFRO) a century ago marks the beginning of formal international cooperation in forestry; it was a modest start confined to a few countries in central and western Europe. Since then, IUFRO has expanded into a worldwide organization which also includes wood technology in its activities. IUFRO has links with a host of other more recent organizations, especially FAO, which are either dedicated solely to forestry and wood technology or which include these subjects among other activities. Cooperation in the forestry sector also takes place under the auspices of regional bodies such as the European Community (EC), the Council of Mutual Economic Assistance (CMEA) (also referred to as COMECON) in Eastern Europe, and the Nordic Council in Scandinavia. In addition, there are numerous bilateral contacts and joint ventures among countries within Europe as well as with countries elsewhere. Cooperation covers virtually all aspects of forestry and wood technology but is particularly strong in the exchange of information, in research and in development aid.

The driving force behind this surge of international activity has been enlightened self-interest as perceived by the countries, institutions and individuals involved. The specific policies and objectives stated in the Country Reports must be viewed against this background of dominant motive. Indeed, enlightened self-interest is the only reliable basis for any international cooperation.

9.2. Policies and objectives

The following examples illustrate the range of policy objectives for international cooperation:

Denmark: "The main idea has been, and still is, to exchange knowledge and experience or to render development aid to third world countries; in a few cases the connection has grown to a very near cooperation, which has also implied a common budget and collective projects with jointly elected governing bodies. But Denmark has never entered into or wanted cooperation, which could imply domestic obligations concerning forestry or forest industry to be forced upon it against its

will by an international office as is the case with agriculture within the European Community".

Hungary: "The international relations of Hungarian forestry are extensive, in conformity with the country's open-door policy. In addition to the professional - economic objectives, establishment of direct connections between people is also a matter of great importance. Through these contacts, people could become acquainted with each other's culture and traditions".

Netherlands: "Within the framework of the policy for raw materials as a whole, the assumption is that the Netherlands are to a great extent dependent on the import of raw materials for industrial processing and are significantly involved in the trade of raw materials. Thus Dutch interests are central to this policy. Conversely, the development of cooperation policy .... is in the first place aimed at the interests of the peoples of developing countries".

Spain: "The main objectives are to:

- contribute towards the international prestige of Spain,
- improve and update the technical knowledge within Spain,
- contribute towards the development of other countries,
- promote the export of Spanish technology, machinery and equipment,
- participate in international decisions concerning the natural environment, its conservation and the use of its resources".

Sweden: "Participation in development work within international organizations related to forestry as well as bilateral efforts within the fdorestry sector are aimed at supporting agreed objectives within the international and national communities. "Sustainable development" according to the definition by the Brundtland Commission may serve as a concentrated description of these objectives".

UK: "In international cooperation with developing countries it is the national policy of the aid recipient country which determines the nature of the cooperative action". (No mention is made of cooperation with developed countries).

Yugolsavia: "The aim of national policy is to expand the already intensive international cooperation in the field of forestry and the timber industry. ... Yugoslavia, one of the founders of the Non-Aligned Movement, is particularly interested in cooperation with developing countries".

9.3. Fields of cooperation

Fields of cooperation will be considered under three headings:

- Information.
- Joint actions within Europe.
- Development cooperation with third world.

9.3.1 Information

Cooperation is founded on the exchange and dissemination of information. To find out what is happening elsewhere and what others are doing is useful in itself and is the only effective way of discovering whether additional coordinated action of any kind might be mutually beneficial. The major international organizations have achieved a commendably high standard in the collation, analysis and published presentation of statistics and other matters of international interest. International information transfer concerning new technologies is now also served by a constant stream of publications and by numerous seminars, workshops, conferences and congresses. This type of information is produced mainly by specialists and is intended for specialists.

These developments must be welcomed but, unfortunately, the quality of information exchange has not kept pace with the quantity of information on offer. There is also an increasing amount of overlapping and wasteful duplication, and to search for what is really relevant, especially in the voluminous published conference proceedings, is sometimes like hunting for a needle in a haystack. Furthermore, only a minority of speakers at many international gatherings have learned how to make themselves understood. Many talk too fast, try to make too many points and bombard the audience with a vast array of statistics projected onto a screen in print too small to be legible. Interpreters cannot keep pace and even those in the audience who are reasonably fluent in the speaker's language are left bewildered - or sent to sleep!

The policy point in all this is that those who are nationally responsible for choosing authors and speakers for international events should arrange for adequate prior instruction in the art of communication, both written and verbal.

A different policy issue arises from the inadequate flow to forestry practice of information which is of more than local or national significance. The difficulty arises from the fact that practitioners generally have less opportunities than experts to keep in touch with foreign events. At national level, forest managers and forest industrialists are kept informed through refresher courses, technical and trade journals, society meetings, excursions and so on. Relevant information from abroad may also be received through these channels, but the process is often slow and incomplete. There is thus an urgent need for the speedier and more widespread dissemination of information throughout the region about technological, economic and commercial developments which are of more than local significance in forestry, forest industry and forest products. One suggestion that has been made to fill this gap is to launch a forestry journal with an all-European coverage. If the idea is to be pursued, several questions would need to be examined carefully; they include: the journal's scope, content, editorial policy, language(s), frequency of publication, economics (including advertising), possible publishers and possible cooperation with existing national journals.

9.3.2. Joint actions in Europe

Joint activities within Europe are sometimes arranged directly between institutions in different countries or they may be arranged and conducted under the auspices of a regional or worldwide organization. Joint actions are expanding, but the choice of partners continues to be influenced by historical, geographic and political affinities. Finland, in fact, complains: "Too often cooperation is based on cultural, historical and political ties of countries and on the strength of the administration and not so much on the sharply focussed factors which are of mutual interest".

The bilateral contacts which have been reported are listed below. Some countries, including a few with many contacts, have preferred not to mention any particular partners, while most of the others have emphasized that they have only mentioned their principal contacts. Despite these gaps, the list demonstrates the strong bilateral contacts that have been developed.

Reported Bilateral Contacts

Albania: France, Italy, Finland, Romania, Greece, Spain.

Austria: FRG, Switzerland, GDR, Hungary, Poland, USSR.

Belgium: None mentioned in Europe, aid projects in Africa and South America.

Bulgaria: USSR and a number of countries in Asia, Africa and Latin America.

Cyprus: No particular partners mentioned.

Czechoslovakia: Some developing countries of Africa, East Asia, and South America.

Denmark: No particular partners mentioned.

Finland: Nordic countries, USSR, China, France, GDR, FRG, Hungary, Poland, Brazil, Malaysia, Mexico, Tanzania, Zambia, Sweden, Nepal.

France: Canada (Quebec), USSR, Finland, Sweden.

Germany, FR: Austria, Switzerland, Scandinavian countries, Spain, Portugal, Hungary, China.

Germany, DR: Austria, FRG, Finland, USSR, Czechoslovakia, Hungary, Poland.

Greece: Guyana, Brazil, Indonesia, francophone countries in Africa.

Hungary: Bilateral contacts with fourteen countries (no names given).

Ireland:	Countries with an interest in similar culture and wildlife.
Israel:	"Many countries".
Italy:	Ethiopia, Somalia, Zimbabwe, Mali, Sweden.
Luxembourg:	No particular partners mentioned.
Netherlands:	Bangladesh, Egypt, India, Indonesia, Kenya, North Yemen, Pakistan, Sri Lanka, Tanzania, the Sahel Region, Southern Africa, Central America.
Norway:	Bilateral aid to a few selected countries.
Poland:	Czechoslovakia, GDR, USSR, Hungary, Romania, Austria, Finland, France.
Portugal:	No particular partners mentioned.
Spain:	Especially with countries in Latin America and a few in Africa.
Sweden:	The Nordic countries; France, FRG, UK, USSR, Canada, USA; several developing countries including India, Vietnam, Tanzania, Ethiopia and Laos.
Switzerland:	No particular partners mentioned.
Turkey:	No particular partners mentioned.
UK:	Priority collaboration with poorest countries, especially Commonwealth countries in Africa and Asia. (No contacts in Europe mentioned).
USSR:	No particular partners mentioned.
Yugoslavia:	Bulgaria, Czechoslovakia, Hungary, Austria, GDR, Sweden, Finland, Norway, Italy and others.

Only very few countries have provided details of the topics covered in bilateral cooperation. The following are examples:

Bulgaria: "The wood processing industry has always received assistance from the USSR; the most effective aid has been the participation of Bulgarian workers and specialists in the joint exploitation of forests within the Soviet Union. At present a considerable number of our enterprises process logs imported from the USSR, because the volume of large logs available in Bulgaria's forests has been getting less year by year because of the reduction of old stands".

GDR: "In the field of mechanization of forestry operations, joint research is conducted with the Soviet Union, Czechoslovakia, Hungary and Poland. Cooperation dedicated to the protection of forests and

the environment is carried out with Poland, Czechoslovakia and the Federal Republic of Germany".

Poland: "The State Forest Service has taken part for several years in the tri-lateral cooperation Poland-Czechoslovakia-GDR concerning the reduction of industrial damage to forests near common frontiers. Meetings of the Vice-Ministers of Forestry of these countries are held yearly in the context of this cooperation".

The main regional organizations referred to in the Country Reports are:

- the European Community (EC) (which is also sometimes referred to as EEC),
- the Council of Mutual Economic Assistance (CMEA),
- the Nordic Council.

In the case of the European Community with its 12 Member States, the Council of Ministers has authorized the EC Commission to initiate and execute some legally binding common actions concerning forestry. They include: forestry measures in disfavoured regions of the Community, afforestation of land no longer required for agriculture, research programmes for forestry and wood technology, development cooperation with third world countries and legislation to ensure quality standards of forest reproductive material. There is, however, no intention to develop a common forestry policy along the lines of the Common Agricultural Policy (CAP). Indeed, several Member States have stressed that they would block any move in that direction. A feature of forestry cooperation within the EC are the periodic (normally 6 monthly) meetings of the heads of the forestry administrations of the Member States and, independently, of the heads of forestry research.

Participation in the work of the CMEA has been mentioned by:-

Czechoslovakia: "The most important Czechoslovak participation in international organizations is in the Council of Mutual Economic Assistance - the international organization of socialist countries where forestry problems are dealt with by the Permanent Commission on Agriculture with its specialized forestry section. Cooperation is centred on science and practice, on biological, technical and economic issues. The cooperation is implemented in the form of coordination consultations and symposia, transfer of information, consultations of specialists, exchange of scientists and men of practice, etc. Because of its acquired knowledge and experience, the participation of the CSSR is extremely important in questions connected with dying due to atmospheric pollution and unfavourable changes in the development of forest soils".

GDR: "International scientific and technical cooperation has existed for years between Member Countries of the CMEA".

The Nordic Council has been mentioned only by Norway: "Under the umbrella of general political cooperation within the Nordic Council, there is a Cooperative Committee for Research in Forestry with several branches. A common course in tropical forestry is ambulatory between the countries."

Joint forestry actions on a wider European or world scale are conducted under the auspices of governmental organization such as FAO (e.g. the present study) or non-governmental organizations such as IUFRO (mainly coordinated research projects). Significant are also the international agreements for the protection of wildlife and wildlife habitats which have been dealt with in Chapter 4. The Country Reports shed little light on the impacts of international activities and organizations on forestry policy and vice versa. However, the influences of mutual relations, and more especially the indirect influences, are probably greater than might be inferred from public declarations.

The principal international organizations named in the Country Reports are listed below.

CEA: Confederation Europeeenne d'Agriculture, a non-governmental body which includes forestry activities.

CIC: Confederation International de la Chasse (international Hunters' Council).

CMEA: (=COMECON): Council of Mutual Economic Assistance - the international organization of socialist countries where forestry problems are dealt with by the Permanent Commission on Agriculture with its specialized forestry section.

COFO: The FAO Committee on Forestry.

Council of Europe

EC: European Community (also referred to as EEC).

ECE: Economic Commission for Europe (with reference to ECE Timber Committee).

EFC: European Forestry Commission (of FAO).

FAO: Food and Agriculture Organization of the United Nations.

FAO/ECE/ILO: Committee on Forest Working Techniques and Training of Forest Workers.

GATT: General Agreement on Tariffs and Trade.

ICRAF: International Council for Research in Agroforestry.

IIASA: Institute of Applied Systems Analysis.

ILO: International Labour Organisation (with reference to FAO/ECE/ILO Committee cited above).

International Poplar Commission (Secretariat provided by FAO).

International Tropical Wood Agreement (under GATT).

ISTA: International Seed Testing Association.

IUCN: International Union for the Conservation of Nature and Natural Resources.

IUFRO: International Union of Forestry Research Organizations.

MAB: Man and Biosphere Programme (of Unesco).

Nordic Council: Under the umbrella of general political cooperation within the Nordic Council there is a Cooperative Committee for Research in Forestry with several branches.

OECD: Organization for Economic Cooperation and Development.

SILVA MEDITERRANEA: An FAO Committee on Mediterranean forestry questions.

UNDP: United Nations Development Programme.

UNESCO: United Nations Education, Scientific and Cultural Organization.

UNIDO: United Nations Industrial Development Organization.

World Bank.

WWF: World Wide Fund for Nature (previously called World Wildlife Fund).

9.3.3 Development cooperation

Development cooperation figures prominently among the international forestry activities of many countries in Europe. The orientation of aid tends to reflect historical, linguistic and political affinities with sensible emphasis on the poorest countries and, in a few instances, on that rapidly awakening giant: China. Some aid is given bilaterally, some via the regional organizations, especially the EC, and some is channelled through international agencies either directly or via trust funds managed by an international organization.

The controversial policy issues connected with development cooperation are not discussed in the Country Reports. This is understandable, because the major problems that have arisen are much broader than forestry. They concern the whole relationships between industrialized countries, developing countries and the role of international organizations through which development aid is channelled. Crucial issues in this context

arise, for example, from the fact that the countries which provide most of the funds command only a minority of votes. Such issues are clearly beyond the scope of the present study. On the narrower forestry front, however, there are a few points which do deserve attention in the present context, because their neglect can lead to forestry projects being less effective than they could be.

But first, it is worth stressing that controversies have tended to highlight what has gone wrong and not the undoubted successes, where programmes have enabled the recipient country to continue and develop the work after the aid has ceased and the expatriate experts have left. Where difficulties and failures have occurred, the causes generally include one or more of the following:-

- Some donor countries have persuaded developing countries to accept more new programmes than they can properly service with their limited resources of qualified personnel; as a result work already in progress may suffer.

- Unseemly rivalries occur among donor agencies on the one hand, and among various ministries in the recipient country on the other hand.

- Some donors fail to appreciate that expatriate experts must not only be well qualified professionally, but must also be temperamentally suited and willing to learn before trying to teach; until an expert gets to know the country and starts to understand the people, their customs and their language, he cannot become fully effective; development cooperation is just what the word implies: a human and professional partnership, not a one-sided relationship; the most successful projects are generally those where friendships develop between national and expatriate personnel.

- Machinery and other equipment are sometimes supplied, which are quite inappropriate for the conditions of the recipient country; ignorance and misguided trade policies are usually to blame.

- Some projects fail to contribute to the overall development of a country's institutions by seeking to operate independently of them, e.g. by establishing their own research and training capabilities instead of strengthening the relevant national institutions.

9.4 Institutional aspects

In most of Europe, government ministries as well as academic, scientific and professional institutions, organizations and societies are involved with international cooperation in forestry. Forest industries too have their links, and organizations such as the Bulgarian "Lescomplekt" play a part: "Lescomplekt" undertakes consultant assignments as well as projects in forest industrial engineering not only at home but also in a number of countries in Asia, Africa and Latin America. "Lescomplekt" has working contacts throughout the world with similar organizations and with scientific institutions in the fields of forestry and forest industry.

In countries with decentralized systems of government, contacts need not be restricted to federal level. This is illustrated by the FRG: "Mention should also be made of the great number of international contacts of the Lander".

Ministerial responsibility for international cooperation may rest with a single ministry or with several ministries. The range of the reported arrangements is illustrated by the following examples:

France: "Bilateral relations with other countries and the participation of France in international working groups of the United Nations, European Community, etc. are dealt with by the Ministry of Agriculture while the Ministry of Cooperation deals with tropical forestry".

Italy: "International cooperation is the responsibility of the Ministry of Foreign Affairs and is conducted through the normal bilateral and multinational channels".

Netherlands: "National policy for international cooperation in forestry is coordinated by the Ministry of Foreign Affairs. Cooperation of policy regarding timber as a raw material for Dutch industry lies with the Ministry of Economic Affairs. A combined effort will be made by a number of ministries to develop permanent management systems for tropical rain forests".

Sweden: Swedish participation in UN-related agencies is coordinated by the Ministry of Foreign Affairs. FAO-related activities are supervised by the Ministry of Agriculture; ECE-related activities are under the Ministry of Industry; and UNCTAD-related activities such as participation in the International Tropical Timber Organization are under the Department of Commerce of the Ministry of Foreign Affairs. The Swedish International Development Agency (SIDA), under the Ministry of Foreign Affairs, is the executive agency for the major part of Swedish bilateral and multilateral support to developing countries.

Switzerland: "The Ministry of Foreign Affairs, as well as other federal government departments and the professional representatives of the forestry sector, collaborate actively with numerous international organizations concerned with timber, the environment and the protection of nature".

The fact that international relations may strain the financial resources of a small country is made by Austria: "Austria being a small country, one big problem is the financing of all activities connected with forestry and foreigners".

The influence of personal contacts between individuals must also not be underestimated. Indeed they are a valuable complement to the collaboration between institutions in different countries. The most senior officials in national forestry administration as well as the experts in particular forestry and forest industrial activities usually have a good opportunity of meeting their colleagues from other countries at the relevant international meetings. Forest managers have fewer such

opportunities with the result that many take local, traditional practices perhaps too much for granted. Various ways of encouraging more international contacts for forest managers have been tried, including:-

(1) visits by national forestry societies to other countries; such visits are on the increase and have, on the whole, proved very worthwhile;

(2) temporary work experience by forestry students abroad; the value of such work experience depends very much on the arrangements made by the employer;

(3) exchanges of staff at medium and senior levels; the idea is attractive but there are numerous serious practical difficulties, e.g. cost, language and, in the case of families, accommodation, schooling, etc.

9.5 The future of international cooperation

As the readiness for international cooperation in forestry in Europe is well established, there is a sound foundation upon which to build. Three points which concern administration rather than policy have already been mentioned, namely the need to improve the standard of documentation and verbal presentation at international meetings, the improvement of information flow from abroad to forest managers and the need to rectify some common shortcomings in the conduct of development projects in the third world. There are also a few general principles that deserve to be observed.

The first is that there is no point in doing anything internationally that can be done equally well nationally, just as there is no point in doing anything nationally that can be handled equally well at a more local level. Each tier of administration costs money and that cost must be weighed against the expected benefits. Moreover, cooperation in essential matters may suffer, if the machinery for international cooperation is overloaded with inessentials. There is nothing new in this suggestion; it merely applies to the international scene the accepted management principle that decisions should be taken at the lowest level at which they can be taken effectively.

The second principle, which applies more to the supra-national organizations like the European Community than to international organizations such as FAO, is that legally binding agreements or compulsory common actions should only be introduced where voluntary cooperation does not suffice. This approach enables attention to be focused on formal agreements and common actions which are really essential, e.g. measures to prevent the spread of diseases from one country to another.

The third point concerns some aspects of the organization of development cooperation. Third world countries would benefit, if the countries of Europe could agree on a more rational division of labour between bilateral aid projects, projects sponsored by regional

organizations such as the EC and projects involving the various international aid agencies.

With regard to specific aspects of cooperation within Europe, continuing priorities will include: the updating of, and some improvements to, the existing information base (forest statistics, etc.), environmental issues (reduction of pollution, gene conservation, etc.) and certain aspects of research (e.g. combating pests and diseases, forest biotechnology). A possible new priority should be to give forest managers and forest industrialists easier access to up-to-date information on new developments abroad in forestry and forest industry.

10. EPILOGUE

10.1 Introduction

Most Europeans love their forests, but forestry plays only a minor role in the national policies of most countries. It is only when there is a threat of catastrophe, as there is with forest decline, that forestry hits the headlines and receives attention at highest political levels. The low priority generally accorded to forestry is explained in part by its relatively modest direct contribution to economic indicators such as gross domestic product, which is almost invariably less than 5% and often nearer only 1%. Forestry's contributions to the environment and quality of life, although widely appreciated, are more difficult to quantify and tend, therefore, to carry less weight politically than they deserve. Forestry also suffers from the disadvantage in political terms that action on a particular matter is rarely urgent although it may be vitally important in the longer term.

The key problem of forestry policy in Europe is, therefore, to convert a general love of forests into a willingness by the public and governments to give forestry more active support. A first step towards obtaining this support is to have a clear and concise statement of policy objectives such as few countries at present seem to have. The Geneva Declaration and Country Reports have, however, revealed that there is a broad consensus on certain elements of forestry policy although they may not be explicitly stated. An attempt will therefore be made at the end of this chapter to define the forestry policy objectives which all or most European countries have in common. To put that statement into its proper context it will first be necessary to:

- examine the various influences other than government policies which guide forestry development,

- consider the Geneva Declaration in the light of the national policies and these other influences.

10.2. External influences on forestry

The European forestry scene today reminds one of a motley fleet of large ships and small ships, ships from the ages of sail and steam as well as modern liners; they have sailed from different ports at different times, and they are moving at different speeds, but they are all set on a similar course.

And yet there is a serious flaw in this analogy, as there is in most analogies. No government has as much influence over developments in forestry as the master of a ship has over the course and speed of his ship; he can control both with a touch on the tiller and a signal to the engine room; true, he too has to cope with currents and winds from various directions, but they rarely compare in strength or complexity with the factors that governments have to contend with when they seek to influence forestry. One major factor is that the interests of society at large which are, or should be, represented by government do not always coincide with the interests of forest owners, public or private. The main reason is that the costs and benefits to individual forest owners may not

coincide with the costs and benefits to society. For example, giving the public access to forests benefits society but may involve the owner in costs - maintaining footpaths, clearing litter, etc. - and increase the risk of fires. Owners also often aim for a quicker return on forestry investments than society and therefore tend to favour tree species and systems of management which may not be the optimum from the long-term environmental point of view. Government policies seek to reconcile conflicts of interest either by persuasion through incentives (grants, tax concessions) or by legislation which compels owners to act in a certain way (e.g. avoidance of clear fellings where they could cause erosion). Most governments, in fact, use a combination of the "carrot and the stick"; but whatever a government decides, management in forests not owned by the state depends on the actions of thousands, in a few countries even millions of forest owners, most of whom know little about forestry and do not depend on forestry as their main source of income.

But even in the forests managed by the state, action sometimes lags behind stated policy intentions because of lack of funds or for some other reason.

While the wishes of society as a whole are generally reflected in government policy, particular interest groups can exert influence either by lobbying government or by direct action. For example, a great deal is being done for the conservational aspects of forestry in some countries by associations which raise money from the public to buy and manage woodlands specifically for the conservation of traditional woodland types. It is more difficult to assess the influence of such associations and of the "greens" in general on woodlands which are not under their direct control, but it does seem that the influence is greatest when the views put forward are moderate and sensible which, unfortunately, is not always the case.

Forest industries also exercise a major influence on forest management which tends to be most advanced where modern forest industries provide profitable markets.

Villagers living in and near forests continue to have an impact on forestry in countries such as Cyprus or Turkey where villagers depend on state forests for fuelwood and grazing. The impact is both direct and via the influence on forestry policy.

But forestry development is also determined by a variety of external factors. They include:

- economic influences brought into play by the competitive position of

  . forestry versus other forms of land use,
  . wood versus other materials as a raw material,
  . one system of silviculture or management versus others;

- the risks of forest damage from various causes which influence decisions on afforestation and forest management;

- the results of research which influence choice of species and silvicultural practices;

- the view taken of developments in other parts of the world, e.g. on the question: will there by a shortage of timber on the world market?

The positive and negative contributions made to forestry development by these factors vary from country to country and, since some of the factors interact, the individual impact of any one cannot readily be determined. The overall effect, however, is visible and may be summed up by saying that everywhere in Europe forestry has made substantial and steady progress during the past decades and, in some countries, for over a century. On the other hand, progress nearly everywhere has fallen short of declared or implied government policy objectives. The position may be likened to that of a mountaineer who has been climbing for some hours. If he looks back to the plains he has left behind, he feels satisfaction at what he has achieved. If, on the other hand, he looks up towards the still distant summit he knows that he must redouble his efforts.

10.3. Forestry development and the Geneva Declaration

10.3.1. The growing relative importance of the non-wood functions of the forest

The growing importance of the non-wood functions of the forest appears to be appreciated by all countries in Europe; new policies have been and are still being developed as a result; but few, if any, countries have followed the Geneva Declaration's suggested integrated approach to policy formulation in this sphere of environmental and social forestry. Instead, virtually all countries have taken certain particular measures. This piece-meal approach may have its disadvantages, but it is the only practicable way forward in most cases. This is a case where striving for perfection might inhibit the achievement of the achievable good.

10.3.2. Forest protection

The forestry policies of all countries in Europe reflect the importance they attach to forest protection, but difficulties arise sometimes over the implementation of these policies. All countries that have referred to the question of air pollution agree that pollution should be reduced although the necessary action lies outside forestry. An agreement has been reached between a number of countries, including some with no or little damage from this source, to carry out experiments and monitor developments on a comparable basis. This agreement testifies both to the importance that is attached to the problem and to the positive attitude to international cooperation.

Wind, pests, diseases and damage by man through fire and grazing receive considerable attention at policy level, but the measures taken depend largely on the resources of the forestry authorities, including their research facilities, as well as on the degree of assistance they can muster from forest owners and services such as fire brigades. The overall impression emerges that there is a great need for additional resources to implement existing policies; there appears to be less need for new policies.

10.3.3. Afforestation

The huge potential for further afforestation is demonstrated by the fact that in the EC alone there are some 15M ha of agricultural land which is no longer required for food production; there are also significant areas of such land elsewhere in Europe. The availability of this land raises a number of forestry policy issues:-

(1) How much more timber should Europe seek to grow, given the findings of ETTS IV? These findings contain three points which are relevant here:-

- timber supplies under existing policies in Europe are expected to rise more or less in accordance with previous predictions;

- demand will also continue to rise, but somewhat slower than predicted;

- there will be no difficulty within the next few decades of meeting any deficit through imports.

(2) Assuming that additional efforts to increase timber production are considered desirable, how should that effort be divided between afforestation and measures to raise the productivity of existing forests?

The answer to the first question is obviously a matter of judgement. Bearing in mind that forecasts are almost invariably wrong, it is generally prudent to play safe by risking a surplus rather than a shortage; this argument is strengthened by the fact that wood and other materials are interchangeable over a wide range of uses and that demand is therefore somewhat elastic. In other words: if the price is right, demand should increase. While no general conclusions are possible on how much extra timber, if any, Europe should seek to grow, there can be no doubt that the emphasis in afforestation should switch from the relatively poor sites which have hitherto been the only ones that have been made available, to some of the better sites which are now being relinquished by agriculture and where forestry is generally more productive and profitable than on poor sites. Land prices are, however, a complicating factor, because the subsidies which have hitherto been available for food production have inflated the price of good land beyond the reach of forestry. Forestry can only begin to compete for at least some of this land when forestry and agriculture are treated on equal terms.

On the second question: 'afforestation versus improving existing forests', opinions appear to be divided. One view is that foresters should concentrate on putting their own house in order and use their resources to raise the productivity of the existing forests. This view is strengthened by the suspicion that afforestation is to be used merely as a tool to solve an agricultural problem. The opposite view is based on the belief that a given input of manpower and money for afforestation will produce more extra timber at less cost than when applied to raise productivity in existing forests; admittedly, it may take longer. These opposing standpoints ignore the all important social policy questions and

more especially the question: what is in the best interests of the farmers and woodland owners involved?

There can be little doubt that almost everywhere there will continue to be room both for afforestation and for raising the productivity of existing forests, but the balance will vary according to local circumstances. If anything, the overall balance could reasonably move towards more afforestation, especially with fast-growing species for the production of timber and pulpwood; very short rotation energy plantations are economically viable at present fossil fuel prices only under particularly favourable conditions, but they too must be considered.

10.3.4. Size of ownership and management units

The fragmentation of forest ownership in much of Europe among millions of holdings and the fact that most owners depend on them only marginally for their income has generally resulted in poor management. The Geneva Declaration concludes that there is an "increasing need to define the role that small forest holdings could and should play in contributing to national policy goals."

The Country Reports describe the various policy measures that have been adopted to raise standards of management - extension and advisory services, encouragement of groupings of various kinds, financial incentives, etc. Reported results have varied but, in general, progress has been very slow. While there may be a good case for persevering with existing policies in some instances, the question must be asked whether timber production cannot be raised more effectively by other means, e.g. more afforestation and more intensive management of the larger forest holdings?

The Geneva Declaration states that the pressure from society for the more efficient and diversified use of the forest intensifies. The available evidence undoubtedly points to the fact that society demands more diversification and especially more emphasis on the environmental and recreational functions of the forest. There is, however, very little evidence for a demand by society for more efficient timber production.

Such pressure as there is seems to come mainly from the forestry profession. There does seem, therefore, to be a case in certain circumstances for considering a policy of minimum intervention compatible with environmental needs, at any rate for smaller forestry holdings. This is precisely what a number of countries appear to be doing but without advertising the fact, perhaps out of fear that wise inaction could be interpreted as disgraceful neglect.

10.3.5. Development of products and markets

The Geneva Declaration draws attention to three particular requirements in product and market development, namely

- improvement of information on markets and end uses,
- research and development (R & D),
- promotion and marketing.

The Country Reports give the impression that market and product development is most advanced in the countries with the best wood processing industries. This is not surprising because it is only where the industries are strong that they are in a position to sponsor these activities themselves and to lobby government to play its part too.

The other countries do not deny their weaknesses but give little indication of the policies by which they intend to put matters right. The point that needs emphasizing is that product and market development can only succeed if it goes hand in hand with the modernization of the wood processing industries and more especially of the sawmilling industry which is generally the most important as well as the most fragmented and outdated of all.

10.3.6. Wood-based energy

The call in the Geneva Declaration for policies or contingency plans for wood-based energy development appears to be widely followed. Quite apart from the economic forces which have led to great improvements in the harvesting and conversion into energy of residues from conventional logging and from wood processing, especially from pulping, much research and development work is in progress on short rotation biomass plantations. At the present low fossil fuel prices, these plantations are of more immediate interest as a source of raw material to the pulp industry than for energy generation, but at least some of the development work that is going on can serve both objectives. If anything, there is now a need to switch the emphasis from research plots to larger trials and integrated pilot schemes both for energy and for pulping; these pilot schemes should include all steps from planning the plantation to final utilization.

10.3.7. Cooperation within forestry sector

A number of countries have reported what appear to be very satisfactory arrangements for both formal and informal consultations between all sectors of forestry and forest industry. These consultations have the dual purpose of fostering a better understanding between all concerned and of stimulating joint action when appropriate. The available evidence bears out the statement in the Geneva Declaration that governments have an important part to play in promoting these consultations and joint actions. Countries without such arrangements would do well to try to learn from those which have them.

10.3.8. Public participation in policy making

The demand in the Geneva Declaration that governments should actively encourage greater public participation in the policy-making process has hitherto met with varying responses. This participation can be at two levels: within the forestry sector itself and by the public at large.

In countries with formal arrangements for consultations between the various forestry and forest industrial interests, the relevant consultative bodies obviously exert some influence on policy formation. There are also examples where forest owners' organizations or other interested groups have put forward forestry policy proposals on their own initiative. In

countries where there is as yet little non-governmental participation in the process of policy making, the best way forward would appear to lie in promoting the consultations mentioned in 10.3.7. Where the public at large exerts any influence at all, it is usually through particular interest groups such as hunters' associations, ramblers' clubs, nature conservation societies, etc.

Much more difficult to meet is the related demand in the Geneva Declaration that governments should "take steps to strengthen the public's and the legislators' understanding of the complex issues involved". No ready answers can be gleaned from the Country Reports. Insofar as the legislators are concerned, a good start would be, where this has not already happened, to try to ensure that at least sufficient legislators become interested and informed to permit constructive debates in legislative assemblies. For the drafting of sensible forestry legislation governments must ensure that their legal and forestry advisers communicate with one another. This is of course more easily said than achieved.

The public presents a different problem. In fact it may be asked, whether it is realistic to expect the public to have "an understanding of the complex issues involved". After all, most facets of national life present complex issues which can only be understood after careful study; moreover, forestry does not loom large among the priorities of most citizens. What citizens want and need to know is what directly affects them: availability of forest products at a reasonable price, opportunities for recreation, beauty of the landscape, clean air, etc. The Country Reports indicate that most governments have taken commendable steps towards meeting such demands. In this way they may also promote an understanding within at least a small section of the public of some of the broader forestry issues involved.

10.3.9. Policy implementation

The strong institutional framework backed by full political support which the Geneva Declaration postulates as essential for policy implementation is, unfortunately, a rarity in Europe, but most of the Country Reports, understandably, understate this issue, to which there is no easy solution.

The reasons were explained in Chapter 2. In the circumstances, the plea made at the Ninth World Forestry Congress in Mexico in 1985 (Westoby, J.C. (1987): Foresters and Politics in The Purpose of Forests, Basil Blackwell Ltd. Oxford.) that foresters should make their voices heard in politics deserves to be heeded, but with the proviso that, to be effective, these voices must be raised at the right time, in the right place and in the right manner; otherwise the effort may be counter-productive and do more harm than good to forestry and the forestry profession. Moreover it is not always the loudest voices that carry most weight. Indeed, a quiet word behind the scenes may often be both more appropriate and carry more weight than a public speech.

Cooperation between all forestry and forest industry interests enables the sector as a whole to speak with one voice on essential issues and appears generally to be the most effective way of securing a strong institutional framework for forestry as well as adequate political support.

10.4. Identification of common goals

The statement which follows is a preliminary attempt to define forestry policy objectives on which there appears to be general agreement in Europe. The attempt has been made because it is felt that a simple, clear statement of this kind could promote a better understanding among the public and politicians of the main issues involved and thus provide a boost to forestry. The statement is based on the Geneva Declaration and the Country Reports, but omits aspects of policy on which there is no consensus such as the conversion of land under forest to other uses. In a few instances, the objectives as defined in the statement fall short of existing practice in a few countries (e.g. concerning access to forests by the public). These countries are of course not advised to lower their standards.

The wording has been derived in part from a much longer statement of forestry policy objectives which was published by the EC Commission in 1978 after consultations with forestry administrations and a large number of non-governmental organizations (Commission of the European Communities (1979): Forestry Policy in the European Community. Bulletin of the European Communities, Supplement 3/79).

General principles

1. Forests should be protected and managed as a renewable resource to supply products and services which contribute to the general quality of life of all citizens now and in the future. The main objectives should be:

- a sustainable increase in the economic availability of timber and other forest produce,
- the conservation and improvement of the environment,
- the provision of opportunities for recreation.

Where practicable, these objectives should be pursued in conjunction with one another by multiple use management, the weight to be attached to each objective being varied according to the particular circumstances at a given place and time.

2. Forestry policy should:

- be dynamic while respecting the long-term nature of forestry,
- seek to create conditions in which efficiently managed forests are economically viable,
- take account of the distinctive characteristics and complementary roles of the different categories of forest owners as well as of the various users of forest products and services,
- be consistent with other national policies, especially those for agriculture, forest industries and rural development.

Satisfying demand for wood and other forest produce

3. Expected increases in the demand for forest produce should be met by:

- growing more timber,
- making better use of the raw material,
- promoting international trade.

The measures adopted to promote the above objectives in various parts of Europe include the following:

- Silvicultural measures in existing forests:

  . accelerating the regeneration of old stands,
  . earlier and heavier thinnings in young stands,
  . use of fast growing species,
  . use of improved forest reproductive material,
  . fertilization, drainage etc.,
  . protection against fire, storm, disease, pollution;

- Afforestation, including the planting of trees outside the forest;

- Fuller utilization of:

  . trees that are harvested (branches, tops),
  . wood and wood residues by the wood processing industries,
  . wood and waste paper through recycling.

- Organizational, infrastructural and institutional measures to promote efficiency, reduce costs and increase revenues, e.g. improvement of:

  . forest road systems,
  . extension services,
  . market research and development.

Conservation of nature and protection of the human environment

4. As a minimum contribution to the conservation of nature and the protection of the human environment all forests should be managed so as to

- maintain the long term fertility and productivity of the site,
- minimize the risk of causing damage elsewhere,
- take account of wildlife and landscape.

5. Additional conservation measures should be introduced and enforced by law where they are deemed necessary for specific purposes such as:

- protection against erosion,
- conservation of habitats of endangered species of fauna and flora.

The financial consequences of such additional conservation measures should normally be borne by the State also in forests under other ownership.

Public access and recreation

6. Within the limits set by custom and national legislation, access on foot free of charge should be granted to as many forests as possible subject to reasonable and clearly defined exceptions in the interests of:

- nature conservation (e.g. habitats of endangered species of fauna or flora,
- protection (e.g. against fire),
- safety of visitors (e.g. near harvesting operations),
- forest owner (e.g. privacy near dwelling).

7. Where access is granted, the rights and responsibilities of the visitor, forest owner and state or other appropriate public authority should be clearly defined.

Wildlife management

8. Wildlife should be managed and controlled with the following aims in view:

- maintaining a healthy but not excessive population of as many species as are appropriate to a region and in harmony with local traditions,
- avoiding as far as possible interference with other aspects of forest management and agriculture.

Forest industries

9. Forest industries should seek to improve their economic performance and the marketability of their products by:

- better market information,
- investing in research and development,
- product development,
- rationalization of production processes to improve quality and lower costs,
- education and training of architects and other users of forest products.

Institutional aspects of forestry policy

10. Forestry policy should be concerned not only with the identification of objectives but also with the means of implementation and updating. The means include:

- a national forestry authority endowed with adequate powers and resources,

- the necessary legislation,

- financial incentives and a system of taxation compatible with the policy,

- adequate provisions for research, development, technology transfer and specialized services,

- appropriate arrangements for education, training and extension as well as for information of the public,

- arrangements for the collection and dissemination of statistics and other relevant information,

- arrangements for periodic consultations within the forestry sector: forestry authority, forest owners, employees, wood processing industries, timber trade etc.,

- arrangements for a continuing dialogue with representatives of other sectors of national life and especially those concerned with environmental and social affairs.

11. In order that forestry policies may respond to and, if possible, anticipate changing requirements they should be subjected to frequent minor adjustments and periodic major reviews involving thorough consultation of all interests involved.

12. International cooperation

The countries of Europe should continue to develop cooperation in forestry among themselves and with the rest of the world so as to promote their own interests as well as those of all mankind. The Tropical Forestry Action Plan, launched by FAO in 1985, provides a good framework for cooperation with developing countries.

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STATISTICAL ANNEX

	Total Land Area (million ha)	Forest areas (million ha)			Annual Production (million m³)
		Total	Public	Private	
Albania	2.8	1.0	1.0	-	2
Austria	8.3	3.8	0.8	3.0	14
Belgium	3.1	0.7	0.3	0.4	3
Bulgaria	11.1	3.8	3.8	-	4
Cyprus	0.9	0.2	0.2	-	-
Czechoslovakia	12.5	4.6	4.6	-	19
Denmark	4.2	0.7	0.3	0.4	2
Finland	30.5	23.2	6.8	16.4	42
France	54.3	15.1	3.9	11.2	41
Germany DR	10.6	3.0	2.6	0.4	11
Germany FR	24.3	7.2	4.0	3.2	34
Greece	12.9	5.8	5.4	0.4	3
Hungary	9.1	1.6	1.6	-	7
Ireland	6.9	0.4	0.3	0.1	1
Israel	2.0	0.1	0.1	-	-
Italy	30.1	6.4	2.5	3.9	9
Luxembourg	0.3	0.1	-	0.1	-
Netherlands	3.4	0.4	0.2	0.2	1
Norway	30.7	8.7	1.3	7.4	10
Poland	30.4	8.7	7.1	1.6	23
Portugal	8.6	2.6	0.4	2.2	9
Spain	49.9	12.5	4.4	8.1	18
Sweden	41.1	27.8	7.4	20.4	53
Switzerland	4.0	1.1	0.8	0.3	5
Turkey	77.1	20.2	20.2	-	16
United Kingdom	24.1	2.2	1.0	1.2	5
Yugoslavia	25.6	10.5	7.4	3.1	16
USSR	2227.4	929.6	929.6	-	379

Sources:
Areas: Forest Resources of the ECE Region 1985.
Production: FAO 1987 Year Book of Forest Products.

Note: - signifies less than smallest recorded unit.

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M-36/T0256E/1/11.89/1800
ISBN 92-5-102902-4