

# Guidelines for forest policy formulation

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PAPER

**81**

by

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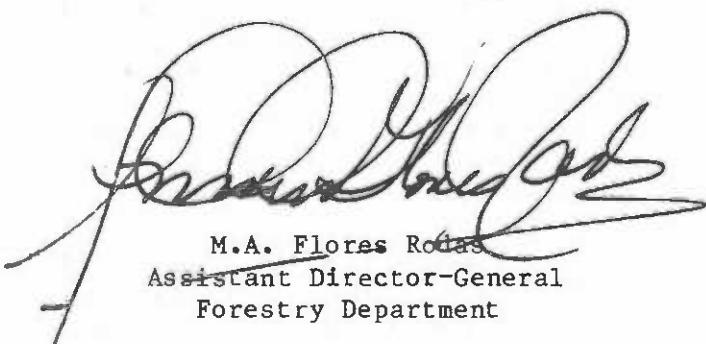
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FOREWORD

Most of the existing literature on forest policy consists of historical descriptions of how forestry developed over the years, of current policies and programmes in certain countries, or of discussions of controversial issues faced in the past or currently being debated. Such literature has been more concerned with the contents of forest policies than with clarification of what is a policy and how it is formulated and executed.

These documents have been valuable since one learns from the past. Indeed, this is one of the principal benefits derived from the study of history. Interpretation of the results achieved under different policies provides information to support or refute proposals for future policies. In short, the study of historical or descriptive treatments of specific policies is an invaluable exercise to assist policy making in the future.

Specialists in forest policy have intuitively or empirically developed their methodologies, formal or implicit, for policy formulation and this manual is not aimed primarily at them. However, they may find that the ideas presented here coincide with theirs, giving them at the same time the added feature of a structured and disciplined presentation. This publication has been prepared principally for persons both within the government forest administration and in, or related to, the forest sector in general, who are not specialists in policy but participate or are drawn into policy formulation and execution. It is hoped that it will help them to gain a better understanding of the processes and how they work, resulting in the benefit of better policy formulation and execution and ultimately in more appropriate and efficient forestry development.



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## I. INTRODUCTION

Forests and forest lands occupy about a third of the world's land surface. The importance of this vast area to human welfare has been increasingly manifest throughout history and how to manage it to satisfy human needs is no small matter. Forestry is the intricate complex of activities to obtain the goods, services and benefits that this natural resource affords for economic and social development, both for individual countries and internationally 1/.

A definition which is well worth pondering is the following, adapted from Kennedy (1985): "Forestry is the management of forest resources to provide a satisfactory amount and mix of social values (consumptive and non-consumptive) for clients living, while protecting these values and use options for future generations".

Forestry has evolved into a web of interrelated activities that go far beyond the forest and, in varying degrees, affect everyone. The intimate relationship of the rural population to the forest, in the form of a provider of materials, fuel, food and employment needs no elaboration. However, the urban dweller, together with the rest of the population, also is dependent on the forest, albeit in a less obvious way. The house one lives in with its furnishings, the water one drinks, the very air one breathes, many of one's recreational activities, and to a growing extent, the fuel used for heating and cooking are all dependent on the forest resource.

The rational use of the forest resource requires decisions on what goods, services and benefits we wish to obtain and, subsequently, on other decisions on how we propose to get them. Policy questions may range from what may seem trivial to the momentous: from an issue of whether or not villagers should be allowed to gather fuelwood on government lands (this will not be trivial to the villagers) to a critical decision on whether or not the government should regulate the use of privately owned forest resources.

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1/ Actually the limits of what is forestry today are rather hazy. In its strictest sense all forestry activities have as their base the management of associations of trees and the lands upon which they grow to provide benefits to mankind. However, forestry has evolved to include, in many countries, other wildlands which do not support tree populations. This has occurred because a jurisdictional vacuum has often existed --Who deals with other wildlands that are not devoted to agriculture or other specified uses? Forestry has tended to expand to include these other wildlands because their management was not definitely assigned to any other discipline. In addition, forestry has expanded to include agroforestry, urban forestry and the management of small woodlots. However, the main thrust concern of forestry is still with forests and forest lands.

The following chapters of this publication try to provide guidance on the process of deciding what we want from our forest resources and on the legal and administrative means required for obtaining them; in other words, guidance on policy formulation 2/.

It must be emphasized that this publication does not intend to advocate any specific policy or decisions on any issue since there can be no one single forest policy appropriate to all countries. It is impossible to state unequivocally what should be a national forest policy appropriate for all countries. The content of a national forest policy must be tailored to the desires and conditions of a country which, obviously, vary widely. This point is discussed at length in Chapter II. Of course, a consensus has been reached on certain very broad policy issues which have a universal applicability. For example, the desirability of controlling deforestation and reforestation, the prevention of the extinction of various species of wild flora and fauna and the control of environmental contamination are universally accepted. As the policy issues become more specific, the alternatives and choices become more debatable and policy content more variable in different countries.

In choosing the objectives of a forest policy there are innumerable and repetitive issues which may arise. A certain number of these issues are fundamental and must be faced in the formulation of the policy objectives for any country. Chapter II attempts to highlight these main issues, somewhat in the form of a checklist, but does not attempt to discuss their merits and demerits, nor does it make recommendations on what decision should be taken. This type of presentation is used since a discussion of each of the issues mentioned would be a formidable task far beyond the possibilities of any single document. All of the issues are controversial and any attempt at a searching analysis would be a monumental effort.

Forest legislation is discussed in Chapter III in a general way, concentrating on its relation to policy formulation and execution, with cautions on pitfalls to be avoided and guidelines to use in the preparation of laws. Also suggestions are given on the format and organization of legislation together with a procedure for testing legislation against policy objectives. In recent years, there have been several attempts at the preparation of overall natural resources legislation which include forest legislation as one of its components. The advantages and disadvantages of such an approach are also discussed.

Finally, Chapter IV is a condensed presentation of the relation of a governmental forest organization to the formulation of forest policy. In view of the voluminous literature on organization, management and administration no attempt has been made to go into details on these topics in the present document.

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2/ Worrell (1970) distinguishes between "policy formation" and "policy formulation". He states that policy formulation "is the process of preparing a systematic statement of the settled future course which a society has agreed to follow. This process takes place in legislatures and administrative agencies but also in the rules and resolutions committees of all kinds of organizations. It is an important process but a narrower one than policy formation which involves things that happen before a society gets around to actually formulating a policy statement and also changes in policy that occur while the formal policy statement remains unchanged".

## 1. What is a Forest Policy?

What is a policy? If one were to pose the question to a number of people, undoubtedly, a variety of responses would be received. Although the term is used constantly, a little investigation and reflection will reveal that the concept of "policy" is somewhat vague or flexible without a single specific, universally accepted definition. Referring to different dictionaries we will find that there are various definitions and understandings of the term.

Shown below are some of these:

- (i) A definite course of action adopted for the sake of expediency.
- (ii) A course of action adopted and pursued by a government, ruler, political party, etc. according to the social and economic objectives which it is desired to achieve.
- (iii) Action or procedure conforming or consistent with reference to prudence or expediency.
- (iv) Prudence, practical wisdom.
- (v) Art, doctrine or opinion referring to government.
- (vi) Matters of interest to the state: method of managing them.
- (vii) Art of conducting a matter to achieve an objective.

To clarify the matter for our purposes when we refer to a country's forest policy, its agricultural policy, its foreign policy or its policy of any type, we should understand policy to mean the way in which a government uses its institutional and legal means to carry out its programmes of activities aimed at achieving its chosen objectives 1/. Referring specifically to forestry, Worrell (1970) states that "A forest policy specifies certain principles regarding the use of a society's forest resources which it is felt will contribute to the achievement of some of the objectives of that society".

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1/It is interesting to consider the relationship between policy and politician. Due to the occasional use of less than completely honest means to achieve and exercise positions of power in a government, the politician has frequently been referred to with disdain or contempt. However, we should remember that, apart from "politicking" tactics, a politician is one who has defined his policy and seeks or has attained the position which allows putting this policy into effect. A politician, after an honourable career may be granted the encomium of being called a statesman.

Remembering these explanations as a reference base, one can study many declarations which purport to be forest policies and find their contents quite variable. The following different interpretations were encountered in reviewing a sample of what were entitled "forest policies" for different countries and various references on forest policy.

- (i) A history of forestry issues and development in the country.
- (ii) A review of the status of forestry in the country, e.g., description of the resource, productive capacity, consumption, exports/imports, industrial structure, etc.
- (iii) Overall and specific objectives indicating the interest and aims of the government for the use and development of the nation's forest resources.
- (iv) The presentation of the government's programme of activities in the field of forestry.
- (v) Statements of quantitative targets to be achieved, e.g., number of hectares to be planted; number of cubic metres of timber to be harvested; tons of pulp to be exported, etc.
- (vi) Description of all public actions which significantly affect the use and management of forests, both publicly and privately owned.

Forest policy has often been interpreted as restricted to the setting of goals or objectives for national forestry development. This publication views forest policy as being much broader but includes the definition of objectives as a major and fundamental component. Consequently, any single one of the examples as an expression of policy is partial or incomplete. Of course, in arriving at what this publication presents as a forest policy, it will be necessary to incorporate practically all of the interpretations mentioned above.

At the same time, one must remember that policies are formulated for the future and not for past actions. This is especially important in forestry since the time horizon for many decisions is lengthy. For example, a decision to provide raw material for forest industry by initiating a programme of plantation establishment means that a policy decision has been taken which will be in effect for many years to come. Of course, numerous other decisions may have effects of shorter duration.

Policy is not the same as planning. Policy is a more inclusive concept which embraces planning as one of the elements of implementing policy (see Section 3 below).

It is worthwhile to point out and emphasize that all of the ideas which have been expressed and will be presented subsequently are completely pertinent and applicable to other sectors of a nation's economy such as health, education, agriculture, mining, fisheries, etc. 1/. Further, the concepts are also valid for private organizations and individuals. Of course, in our discussions we shall concentrate on forestry matters but always keeping in mind that the principles and concepts are general and can be applied to whatever organization and, even on a simplified scale, to one's personal life and career.

## 2. The Importance of a Forest Policy

Why is it important to define and establish a forest policy? Is it worth the effort? What are the benefits to be derived from such an exercise? Defining a government's forest policy is fundamental since the definition sets the framework in which all forestry activities in the country must be carried out. (See King, 1974 and 1975, for interesting views on forest policy formulation and national development). The most important of the forestry activities affected by a country's forest policy may be categorized as: (1) conservation, protection, administration, management and utilization of forests, (2) environmental protection and, (3) forest industries and marketing of forest products. In some countries activities related to wildlands, national parks and wild fauna may also fall under forest policy. However, it must be emphasized that the ultimate purpose of a forest policy is to benefit society and not trees, land or products.

The ideal situation would be to have a formal document covering all aspects of the country's forest policy. This utopian situation is rarely, if ever, achieved. The more usual case is that certain elements of a country's forest policy may be formally declared in a written document while other elements may have to be interpreted from legislation, plans and programmes. The overall government policy may be, in effect, an aggregation of individual, interrelated policies, each of lesser scope, some written, others implicit, regarding numerous forestry issues which have accumulated over time. If this is the case, it would be worthwhile to try and pull together the scattered elements into a more formal, integrated policy statement, since the resulting usefulness of this consolidation well warrants the effort. A comprehensive policy statement provides orientation for the choice and execution of govern-

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1/ Prats and Speidel (1981) have stated that the term "forestry sector" has acquired the meaning of the "scope of implementation of forest policy". They imply that it covers all activities based on forest land as well as the goods and services that society derives from this land. Some people may also include other activities such as those of agroforestry and urban forestry, windbreaks, and line fences as being in the forestry sector. Note that in some countries the definition of "forest land" may be expanded to include such areas as deserts, high barren mountains, dry cold steppes and other lands without a tree cover. (These lands may include areas with a potential for afforestation). A better term for such an all-inclusive concept would be "wildlands".

ment activities which affect both state as well as private forests and forest lands. Government forest policy profoundly influences the way in which private organizations and individuals can utilize their forest resources and carry out their programmes and activities. Without a clearly enunciated policy, there are negative effects both within the government and for the public. Within the government, it is difficult and uncertain to know if there is an appropriate body of legislation, if an appropriately structured agency or agencies exist and if they are carrying out adequate programmes. Additionally, the governmental forestry organization runs greater risks of inconsistencies and illogical variations in its work programmes from year to year. Coupled with this is the tendency to take too many ad hoc decisions that can be contradictory and create confusion within the forest organization and, above all, confuse the public. An explicit statement of policy objectives aids in decision-making at the higher governmental levels, it provides a guide for the sub-units of the governmental forestry organization and helps in making decisions on resource allocation by planning and budgeting offices.

Without an understanding of governmental forest policy, private organizations and the public in general are prone to misunderstandings, misinterpretations, conflicts and a climate of uncertainty that will surely have an adverse effect of the development and achievement of governmental programmes as well as those of the private sector. In addition, for the private sector, governmental policy influences, among others, decisions regarding investment, expansion or retrenchment in forest industries and, in turn, on the price and supply of forest products; it influences the management, exploitation and regeneration of forests and forest lands; and it affects decisions on the possible conversion of forest land to other uses.

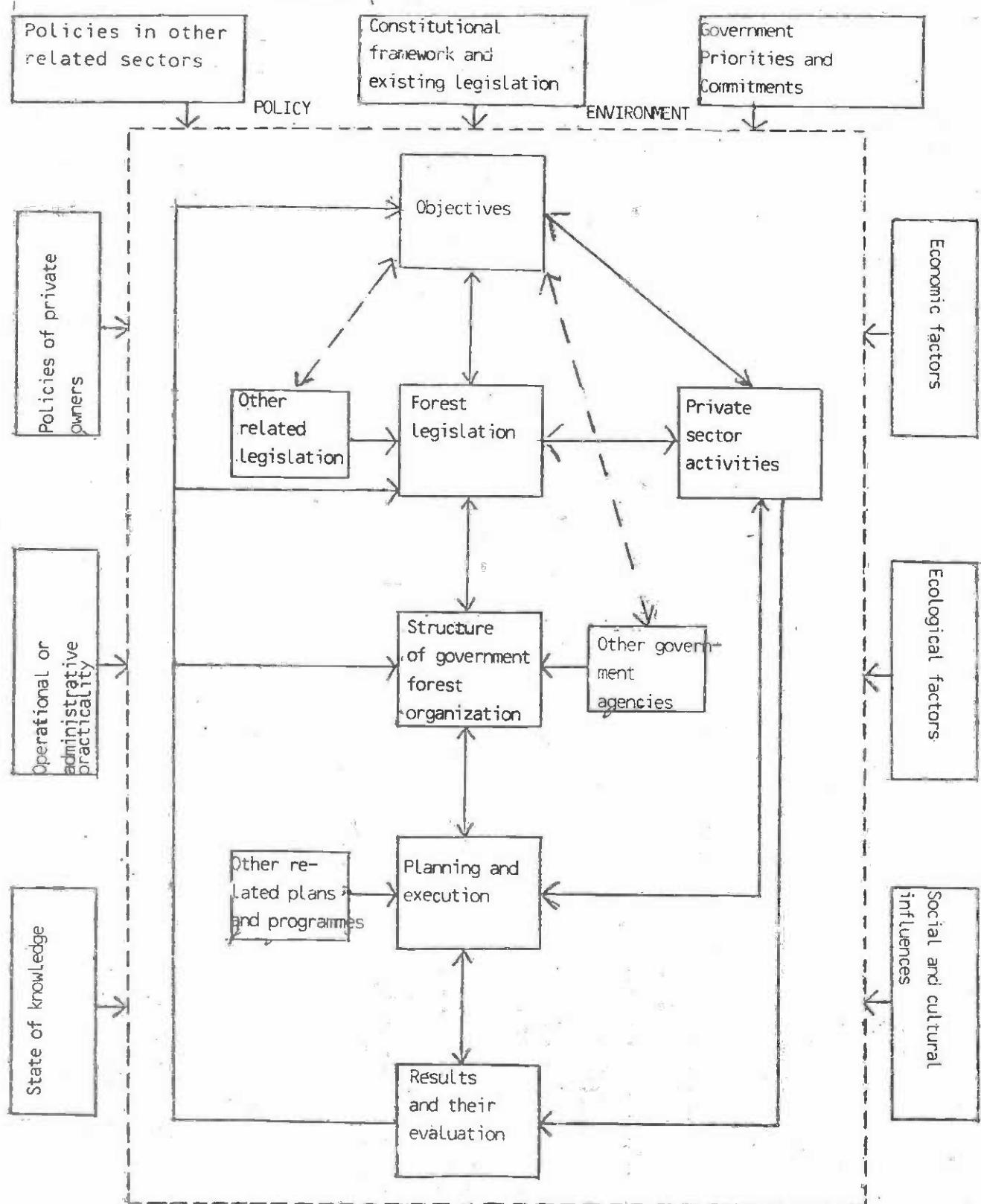
Finally, forest policy has wider impacts on forestry-related situations and activities such as rural community development, agricultural policy, environmental contamination, the existence of facilities for recreation, water supply and many others.

### 3. Forest Policy as an Integrated System of Elements

A country's forest policy is best understood as a system of interrelated elements. The system (or policy) establishes the form in which a government carries out its forestry programmes and influences or controls how the rest of the population makes use of its forest resources. The elements that constitute a forest policy have been alluded to previously but indirectly. Here we can state that a forest policy is a system which consists of the following elements:

- (i) The statement of objectives
- (ii) A body of legislation
- (iii) The structure and administration of a governmental forest organization
- (iv) The planning, budgeting and execution of programmes of the governmental forest organization.

Fig. 1 FOREST POLICY AS A SYSTEM



These elements form a logical and coherent chain 1/. If one does not appreciate the interrelation and interdependence of these elements, there is a serious danger of committing errors or omissions in the determination of objectives, in the formulation of legislation, in the structuring of the forestry organization, in the preparation and execution of its work programmes and budgets and in clarifying the role of the private sector in relation to government policy. Actually, these elements constitute a cyclical system as shown in Fig. 1. It can be seen that there is a two-way movement between each and all of the elements in the system. This means that any element can be altered by returning to a preceding stage if found necessary. In other terms, a forest policy is a continuous process rather than a discrete procedure with a definite beginning and end. In spite of being cyclical, conceptually, the entrance into the system is logically the taking of decisions on objectives. The assemblage of chosen objectives is, or should be, the basis or foundation of the other components of the system 2/. Of course, once objectives have been stipulated it is always possible, or better to say, necessary, to return frequently to the point of origin (the objectives) to decide if they require any modifications.

Referring to the diagram shown in Fig. 1, following decisions on objectives it becomes possible to prepare, check or revise forestry legislation to see if the legal implements exist which will contribute towards the realization of the chosen objectives. Other legislation affecting forestry such as land tenure, taxation and soil and water conservation must be taken into account in this process. Of course, forest legislation, together with all other legislation, must be in harmony with the constitutional framework and basic laws of the country as well as forest policy objectives. Following the establishment or revision of the legislative framework, one then considers the existence and structure of the government organization charged

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1/ If one prefers the more limited definition of a policy as a statement of objectives or intent, then the system can be divided into:

- a) The statement of policy objectives
- b) Actions necessary to achieve the objectives

However, regardless of the preference on how to characterize the system, the total content is the same.

2/ King (1972) has emphasized that "Because of the sometimes lengthy gestation period of forest crops, the numerous kinds of forest products, the variability and complexity of the production function of the forests, the differing types, scales and requirements of forest industries and the many services which forests provide, it is essential that forest policies be formulated in which objectives are clearly defined and the means of achieving these objectives distinctly stated".

with the responsibilities stated in the legislation 1/. In this process, one can formulate, check or revise the functions and structure of the organization in reference both to the objectives and legislation. This structure may be affected by the standard organizational pattern used by a government and by the structure of other agencies. Once the structure has been established, the organization must plan and execute its programme of work and budget. Cognizance must be taken of the plans and programmes of other governmental agencies and even private organizations in the process. One should note that other governmental agencies may also be affected by the objectives of national forest policy. Here again, the objectives and legislation form the basis for programme formulation. One refers to each objective and its related legislation to determine if there are activities which contribute to its realization. The elements of structure, planning and execution taken together form the administrative portion of the system.

As shown in Fig. 1, the activities of the private sector are strongly influenced, and in some aspects, restricted or controlled by policy objectives, legislation and programmes of the governmental forest agency. At the same time, the interests and activities of the private sector can have a reciprocal influence on the objectives of a government forest policy and on legislation. The compliance and observance of the objectives, laws and controls by the private sector must be evaluated in combination with the results of the governmental forest agency's programme. This evaluation will then have an influence on the objectives, legislation, structure and programmes of the governmental organization, completing the feedback or cyclical pattern of the system.

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1/ In this and other documents, a government forest organization may be referred to by a variety of synonymous terms such as public forestry administration (PFA), state forest authority and forest service. These are all general designations referring to the principal organization in the governmental structure charged with carrying out state forest responsibilities. The specific name in any country will vary widely. However, we must remember that there may exist more than one governmental agency with activities related to forestry. For example, governmental agencies with responsibilities for lands, agriculture, land settlement, trade, industry and national parks may have important roles in forest policy formulation and execution.

An understanding of policy as a system is useful both in formulating a new policy or in evaluating and revising an existing one 1/. In many instances the sequence of considerations and actions regarding the elements of a policy as described above are not or cannot be followed in these exercises. Choosing any element of the system as a starting point causes no problem since following the cyclical pattern assures that all the elements will be drawn into the analysis. The sequence indicated would be most appropriate in formulating a policy if, previously the objectives had not been chosen, and legislation and an organization did not exist, making it necessary to begin from zero. However, in the majority of cases, there are previous developments or efforts and one must enter the system at a point or points which may not be the initial step of defining objectives. Frequently, legislation has been enacted and a governmental forest organization (or more than one agency) has been established and is operative without the formal declaration of policy objectives. Actually, this is the most common situation and may yield satisfactory results if the implicit objectives of a policy are well recognized or can easily be inferred from an interpretation of different sources such as legislation or plans, without being formally declared or stated in a document. However, the absence of clearly defined objectives carries with it the risks of conflicts or gaps in the legislation, as well as badly structured organization and ill-prepared programmes of work and budget that do not adequately cover the responsibilities of the public administration.

It is important that a policy be evaluated frequently to determine whether or not it should be maintained, amended or eliminated. To be able to evaluate policy implementation in time for alternative or corrective action, the policy system must be kept under constant surveillance. The document, U.N. 1981, points out that "In many developing countries, policies are not, in fact, systematically reviewed or evaluated. Evaluation is possible only if the goals of a policy are clearly set out. The lack of a clear goal, or goals, is a severe constraint on an objective analysis of government policies".

An evaluation of a policy really means an examination of each of the elements of the system shown in Fig. 1, both individually and in their inter-relations with all the other elements of the system. An evaluation of the objectives of an existing policy requires that they be examined in the light of the influences and criteria of the policy environment described in the following section to see if they are being achieved and if they should be continued, modified or dropped. In such an examination, an attempt should be made to determine the opportunity costs involved in attaining the chosen objectives. These costs refer to the sacrifice of other possible benefits from discarded alternative objectives when carrying out a given policy. The achievement of these objectives in the final analysis is the output of the other elements in the system. Evaluating legislation requires that it be reviewed to see if it is still appropriate, if it is being observed

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1/ The term "policy analysis" is frequently used in the sense of studying the various alternatives for the elements of a policy system (most commonly the objectives or goals) which may be chosen in formulating or revising a policy.

and enforced and if it is achieving expected results. An evaluation of the administrative portion of the system (structure, planning and execution) looks into the way the public forest organization is operating 1/. To complete an evaluation, the actions of the ancillary elements: private sector activities, other legislation, other pertinent government agencies and their plans and programmes must also be taken into consideration in their effects on forest policy.

These evaluations may be undertaken at any time during the life of a policy or at stated times such as at the end of a programme period or annually. They have the following major purposes: (1) To make changes at any time when they are considered necessary, (2) to evaluate the results of the application of the policy, and (3) to guide the revision or formulation of policy for the future.

#### 4. Who Determines Forest Policy?

Although the formal enunciation of a national forest policy or its components is usually a government responsibility, the determination of its contents is a complex, rather amorphous procedure which has often been characterized as a "political" process in which there are many actors or participants. It is political in the sense that decisions are the outcomes of debates, negotiations, controversies and compromises on the part of persons or organizations with different opinions on what should be the policy on some issue.

The form in which the different actors play a role in formulating and executing a forest policy, as well as other governmental policies will depend on the socio-economic-political system of the country. Regardless of the form of government, one must understand that forest policy implementation requires the participation and acceptance of the population as well as that of government agencies and officials. To implement a forest policy successfully, government authorities must take into account the receptivity and demands of those whom the policy will affect. If a policy or some of its elements are resisted by the public the chances of success are greatly reduced or nullified.

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1/ The elements of structure and the planning and execution of work programmes form the implementation portion of the policy system. As stated in the document, U.N. 1981: "The policy implementation (portion) should not be concerned only with carrying out policies already accepted. In the course of implementation, new demands often emerge and have to be transferred to the policy-making machinery. Such demands must be transferred into policies. As a consequence, an original policy might be revised or abandoned. Thus formulation and implementation of policies are not necessarily distinctive phases of policy activity. Policy review can be conducted at any stage of implementation or formulation whenever necessary.

Formerly, the choice of forestry objectives and the execution of programmes for their achievement was considered the exclusive domain of professional foresters in the public forest administration. The forester knew what was best for the forest and assumed, by extension that his decisions were also those best for the public. With greater interest by the public in forest, land and environmental management, this assumption is no longer acceptable. In the past, the forester was to a certain extent isolated from the community. Most professional foresters looked upon themselves as custodians of the long-term interests of the community where forestry and forests were concerned. Many still cling to the conviction that they and no one else, are the proper judges of where that long-term interest lies. As a result, forest administrators have often revealed themselves insensitive to local community needs. Hendee (1984) reporting on a survey of public opinion in the U.S. has pointed out that " In the final analysis, it is the human dimension of forestry that most needs our attention. The public opinion surveys show that people distrust many of the methods that the profession uses to conduct forestry."

The main participants in the determination and execution of forest policy may be categorized as: governmental authorities or bodies, interest groups, political parties, mass media and, multilateral and bilateral technical and financial institutions.

a) Governmental authorities or bodies

A governmental forest authority may have the most prominent and visible role, yet strong influence and even the final taking of decisions on forestry matters may be assumed by other components of the government.

Active and powerful parliamentary institutions with lawmaking and funding functions can have a strong influence on forest policy. The enactment of laws and the appropriation of funds for programmes mean that the legislative body is trying to achieve objectives, be they explicit or implicit. In its legislative activities, parliamentary bodies often draw governmental agencies, in this case a forest authority and other agencies with forestry-related programmes, into its deliberations by requesting information and further explanations of their programmes.

A governmental forest authority will be limited to a certain extent in its policy formulation and execution by basic legislation of a broader nature directly or indirectly related to forestry. Other governmental agencies with forestry-related responsibilities such as a ministry of lands, a national park service, an environmental protection unit, a regional development agency, and water or flood control agencies can strongly influence the objectives of a forest policy and its execution. In some countries, a ministry of defence, in the interest of national security, can have a major influence, especially in relation to forest areas and wildlands located on the country's frontiers or borders with other nations. A planning and budgeting office can also play an influential role by having the final say in financing programmes to achieve chosen objectives.

Officials at high levels in the government authority can play a major role in forest policy formulation. Heads of government or senior officials in its units, through the authority and power of their positions, can take positions on policy questions and press for their implementation. Depending on the form of government and the authority and power of the official, the acceptance and implementation of his view may be obligatory or, in other

instances, may require further support and authorization. Since these decisions often involve value judgements, personal convictions and beliefs, differences of opinions invariably arise resulting in conflicts and debates between personnel of governmental units and also with members of legislative bodies.

b) Interest groups

Outside interest groups can express opinions on the multitude of possible policy issues and actions and try to persuade their representatives and government bodies to accept their views 1/. These interest groups may consist of persons especially concerned with conservation or ecology, of professional organizations such as forestry societies, of industry associations and economic groups with common interests such as farmers or resort operators. These groups may be temporary, organized in response to some current or transitory dispute. Groups of this type usually have as their objective the prevention of some action. Once the issue is resolved the group disappears. Other groups may be well-organized, permanent associations which have a clear, firm policy on major, continuing issues and take stands on others as they arise. In the United States, groups with special interests have resorted to court suits to contest policies and to stop actions which are contrary to their views and which they consider detrimental to the public interest (See Clawson, 1975). Many of these groups enjoy wide public support for their environmental goals, somewhat to the surprise of professional foresters. Thus, groups or organizations supporting non-consumptive forest values such as the preservation or conservation of certain species of flora and fauna, or recreational, scenic or wild areas and environmental protection can advocate a forest policy restricting or prohibiting exploitation of the natural resources on areas where they occur. A river dam which may have a negative effect on a fish population, the construction of a road through a scenic area, the use of an unaesthetic harvest cutting method may be opposed and a court injunction sought to prevent their being carried out. Groups or individuals more concerned with utilitarian or consumptive values such as industrial development and the exploitation of natural resources for economic gain and expansion may press for a contrary policy.

Most of the forest policy conflicts which have occurred in recent years have been clashes between groups more interested in the non-consumptive forest values (recreation, aesthetic enjoyment, tourism, environmental protection, emotional uplift) with groups more dedicated to the consumptive forest values (wood and other tree products, wildlife for food, etc.). Until recently most

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1/ The term "group" is used in the sense of one or more persons with certain interests or opinions that advocate a particular policy or course of action.

professional foresters would be placed in the latter group. Further, Kennedy (1985) has pointed out that groups living in urban societies tend to place more importance on the non-consumptive forest values while people living under rural, agricultural and forest conditions or dependent on their natural resources are more interested in the consumptive values.

The effectiveness of an interest group in influencing forest policy decisions depends upon the following three factors: the group's interest, its power and its access. If most or all of the members of a group have the same interest and share similar opinions, the group will have greater influence than if a diversity of interests and views exist. Power refers to the capacity of a group to command the attention of policy makers. To a great extent this is a function of the size of the group and its financial resources. Finally, the greater the access of a group to policy makers the more likelihood that the group will influence policy decisions.

In addition to the initiative of outside groups, the government itself may make use of opinion polls, surveys and public meetings. These may be on a regular, periodic basis or ad hoc, carried out when some particular issue arises. For this type of democratic participation to be most effective it requires that much government information be made available to the public so that expressions of opinion may have a sounder basis.

c) Political parties

Political parties, when they exist, may express opinions and exert pressure regarding forest policy issues. Their effect is similar to that of interest groups although political parties are usually established with much broader aims than simply for forest policy. However, there has been a tendency for persons interested in ecological issues and the prevention of environmental pollution to band together in political parties or to make these issues prominent in the platforms of existing political parties.

d) Mass media

Newspapers, magazines, radio and television are the principal means of mass communication which are used by all the participants in policy questions to publicize their views and try to convince government authorities and the public of the validity and correctness of their positions. In addition, the proprietors and managers of these mass media may have their own personal views which can be pushed effectively since they control the channels of communication.

e) Multilateral and bilateral technical and financial institutions

Especially in the less developed countries which are recipients of technical and financial assistance under bilateral arrangements or through multilateral means, such as the United Nations and its family of agencies, these donors can influence national forest policy. This may be done by providing expert advice and information to a receptive government or, as is often the case in bilateral assistance, through actions such as making technical or financial assistance dependent upon the acceptance of recommended policy.

There is much value in greater participation by the public in the formulation of a country's forest policy. However, it may be accompanied by the possible disadvantage that excessive public involvement can become counter-productive. If concerned citizens' groups have different points of view among themselves and with the government authority, it may be impossible to satisfy everyone, thus resulting in continuing disputes and delays in decisions. In addition, a system of public participation through meetings and other means of airing views followed by their processing and evaluation can be a costly and time-consuming exercise. In short, the decision-making process to choose objectives and formulate policy in an open society with vigorous public participation can be a slow procedure. (For a discussion of public involvement in U.S. Forest Service decisions see Fairfax, 1975). It is the price a society pays for participatory government but, it has the invaluable advantage of exposing and subjecting policy issues to critical debate and scrutiny which gives greater assurance of more rational and acceptable decisions.

In countries with forms of government in which the public has significant voice and representation through an elected parliament or other representative body, all of the above-mentioned participants can play important roles. In countries with centrally planned or authoritarian forms of government, policy formulation is dominated by the government forest organization together with other interested or related government bodies. In governments of this type most of the significant choices and decisions are made by the state employing a structured planning process. The main difference is that the public has a much less, and even insignificant, role in decisions on forest policy. Public opinion may not have an opportunity to be voiced and organized, independent, special interest groups may not be permitted to exist or opinions must be expressed through official or government-designated bodies. However, in some cases, public opinion may be so strong that, in spite of official obstacles and even repression, views may be expressed. The taking of decisions under authoritarian forms of government can be more rapid and even counter to public opinion. The ability to take speedy decisions and put them into immediate effect may be done at the price of not taking into account contrary, and possibly, valuable different points of view.

f) Advisory units

Regardless of the socio-economic-political conditions under which a country operates, it is useful to establish an advisory board to the government at an appropriate level. The members of the board should not be part of the government but should be representatives of the public and different segments of the forestry and related sectors. The aim of such a council is to make known the opinions and will of the public in forest policy development as well as obtaining specialized knowledge which may not be available within the government. This board may be completely independent of the government forest authority or linked to it in some structural form. The advisory board should have access to the information compiled by the policy analysis unit of the forest authority as well as information from other sources. The advisory board would have the responsibility of expressing opinions and making recommendations on issues of government policy.

## 5. The Policy Environment

In the formulation and execution of forest policy, all decisions regarding the individual elements must take place within what may be called a forest policy environment. All of the participants described in the previous section are or should be affected by the influences and criteria shown diagrammatically in Fig. 1 as impacting on the exterior enclosing box formed by dotted lines. Everything within the box consists of the main and subsidiary elements forming the policy system. Outside the dotted box are those factors which taken together form the environment in which the policy actors or participants take, or try to influence, decisions and actions regarding objectives, legislation, the governmental forest agency and related institutions and their operations together with individuals and organizations in the private sector. The influences or criteria may be categorized loosely into the two groups, technical and political, shown below: 1/

### Technical

- a) Ecological factors
- b) Economic factors
- c) State of knowledge
- d) Operational or administrative practicability

### Political

- e) Policies in other related sectors
- f) Legislation
- g) Governmental priorities and commitments
- h) Social and cultural influences
- i) Policies of private owners

The technical criteria are those which are based upon quantifiable or verifiable analyses or information such as financial and economic studies and the results of biological and physical research. Political influences are of a more subjective nature being dependent to a greater extent upon opinions, beliefs and value judgements.

Each of these criteria will have a direct forestry content but in addition, and of major importance, there are externalities which are not intrinsically of a forestry character but at the same time exert strong influences on what happens in the forestry sector. All of the influences, technical and political, of a forestry character or of a more general nature, involve different interests and points of view, often making decisions

1/ For further discussions of criteria in determining forest policy objectives see Clawson (1975), Worrell (1970) and U.S.F.S. (1981).

controversial. It is impossible to enumerate or describe in detail all these possible influences because they vary, depending on the country and the point in time. Nevertheless, one can mention the most important categories of influences or categories which affect decisions on objectives and, in turn, all the decisions and actions regarding other elements of a given policy. For each of these categories some examples of specific considerations are given.

#### Technical influences and criteria

##### a) Ecological factors

The objectives and programmes of a forest policy must be physically and biologically attainable. Do the physical and biological conditions exist which permit the execution of programmes to attain the objectives? Climate, soils, distribution of tree species and forest types, growth rates, regenerative capacity, among others, must be considered in defining and executing a forest policy. Can certain species be grown under the ecological conditions present? Is an area of land suitable for practical and successful forest management? If the combination of ecological (together with economic factors) in a country or region are favourable, forest policy may aim at intensive management using advanced technology and methods. On the contrary, if these factors are unfavourable, forest policy may have as its objective a custodial or protection level of extensive management.

Ecological factors not intrinsically of a forestry character may also enter the picture. The effects of acid rain caused by industrial processes is a major problem currently affecting forest as well as other policies. The possible laterization of soils in tropical areas as a result of conversion of forest areas to agriculture is another example of an external ecological factor influencing forest policy.

##### b) Economic factors

The relative importance of forestry in the national economy of a country will have an influence on its forest policy. Clearly, if forestry occupies a major role, much attention will be paid to economic aspects in defining a forest policy. On the other hand, a country with little or no forest resources will pay less attention to the necessity of defining a forest policy or forestry will be part of another policy (e.g., rural development, agriculture) since forests contribute little to the national economy. The necessity of providing employment or stimulating the development of rural communities can also influence forest policy. Further, the level of development of forest industries in a country will influence significantly its forest policy. If forest industries are important, a basic objective of a forest policy may be to assure the provision of adequate supplies of raw material of appropriate species, sizes and qualities. Other economic factors affecting the forest policy may be world market conditions for forest products, results of feasibility studies for forestry development projects and the availability of domestic and international capital for investment in forestry programmes.

Two other economic factors to be considered in formulating forest policy are what Clawson (1975) terms economic efficiency economic welfare or equity.

Economic efficiency refers to the costs and benefits entailed in the actions required to achieve a given policy. If the costs of achieving such a policy exceed the expected benefits it is highly questionable if it should be adopted. For some actions, methods of economic analysis of costs and benefits can be employed, especially if benefits have some market value. More difficult are analyses which include goods and services which do not normally have market values, e.g., recreation, wildlife, watershed and aesthetic values. The use of cost-benefit analyses in policy formulation depends on the availability of reliable quantifiable information on all the costs and benefits that should be included and on the validity of the assumptions employed. Even though it may be impossible to make a complete cost-benefit analysis, attempting to do so may provide results which are indicative and helpful, if not definitive, in arriving at policy decisions. Trying to identify and evaluate what the costs and benefits are, while at the same time recognizing the deficiencies in the analysis, can be a useful contribution to decision making. There are numerous references available on methods of economic analysis which may be used in determining economic efficiency. The reader is referred to Gregersen and Contreras (1980), Squire and van der Tak (1975), Gittinger (1972) and Sinden and Worrell (1979).

Economic welfare or equity means that the benefits of achieving some policy will accrue to certain individuals or groups and others will bear the costs. This criterion differs from economic efficiency; one may determine the costs and benefits of alternative decisions but it is more difficult to determine who benefits from and who pays for the attainment of a given policy.

c) State of knowledge

In formulating a forest policy one must consider if the required knowledge, research findings and experience are available to permit carrying out the policy. Is adequate technology available so that the necessary actions can be successfully carried out? For example, is information available to permit the implementation of a policy of regenerating native tropical forests or establishing fast-growing man-made plantations? There is little point in declaring a policy which is too sophisticated for the technological level existent or attainable in the time horizon of the policy.

d) Operational or administrative practicability

Objectives of a forest policy must be operationally and administratively achievable. An objective might be proposed to control the methods of logging on private lands to ensure regeneration. The objective must be tested against the organizational ability (men, material, equipment, funds) to carry out the actions necessary to attain it, e.g. visits of control to private areas being logged and the power to require compliance by the operator or face sanctions. Too often pious, well-intentioned policies are declared with little chance of successful implementation because staff is too limited or inexperienced, vehicles or equipment are not available, funds are insufficient, etc. A proposed objective which cannot be practically achieved is best not included in a policy.

### Political influences and criteria

#### e) Policies in other related sectors

Forest policy cannot be formulated in isolation but should be an integral part and in harmony with overall government policy and those of other sectors of the national economy, especially those dependent on the use of land and other natural resources. It is essential that forests and forest lands be viewed as part of a complex of land uses together with their human and societal relationships and not as an independent and unrelated sector. Thus, forest policy must be consistent with the objectives and programmes of other governmental policies such as for agriculture, agrarian reform, land settlement, rural development, taxation, foreign trade, housing, transportation, sale of state land, prevention of environmental pollution, land-use planning, etc. For example, if the government has as its objective the sale of all state-owned lands to the private sector, forest policy must adjust itself to this decision. Land-use planning, if practised in the country will be of the utmost importance to a forest policy. Since taxes are a significant cost for private forest owners, taxation specifications in a country will affect the profitability of forest ownership. Duties, tariffs and quotas for imports can affect forest industry and the supply and price of forest products. Housing programmes and transportation regulations and costs can also have an impact on the price and supply of wood products.

#### f) Legislation

Forest policy formulation and execution must be in compliance with the constitutional framework of the country and existing national laws and regulations. Theoretically, a forest policy and its components cannot be at odds with the basic constitution and laws of the country although in practice this may be the case until the conflict is resolved. For example, a change in forest policy may be in conflict with older, obsolete legislation, which although forgotten or not observed, is still in force. If forest policy decisions conflict with current legislation there are two courses open: (1) modify the forest policy decisions to comply with existing laws and regulations or, (2) take steps to modify prevailing legislation so that a forest policy decision may be acceptable. Evidently, the first alternative is the usual course; the second alternative is much more difficult and lengthy, although, at times, it may warrant the effort especially if existing legislation is obsolete, inadequate or contrary to new developments.

The interpretation of the constitution and of existing and proposed legislation by the judicial branch of a government may also have an influence on policy. Although the courts cannot initiate legislation or policy they can act on complaints or suits regarding the constitutionality of laws and on the compliance with legislation by government agencies, officials and private, natural or juridical individuals. Courts may have a profound effect on policy in two ways: by prohibitive decisions and by orders of compliance. In relation to the first way, some law or action (constituting part of a policy) which is disputed may be brought before the court to rule on its constitutionality or legality. If a law is considered unconstitutional or unacceptable the court may strike it down or forbid its enactment. If an action, proposed or operative, by a government agency or official or by private organizations or individuals is considered illegal, the court may forbid its execution or continuance. In regard to the second way, the judicial branch may order that these same entities carry out actions which the constitution or laws require.

g) Government priorities and commitments

A government will always have objectives of varying importance and priority in its overall national policy which will have an effect on forestry. As examples, objectives and programmes of high priority of a government may be to favour certain regions of the country, to establish human settlements on its forest lands, to provide jobs to the unemployed or to enhance the security of its national frontiers in forest areas. In addition, the adherence of a government to international treaties may impose certain obligations on its forest policy (see Sand, 1977). If a government has ratified treaties which have a bearing on flora, fauna or protected areas these will be underlying considerations in choosing objectives, drafting legislation and in carrying out work programmes. Examples relevant to wildlife and protected areas are the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) and the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention) at the global level and The Convention on the Conservation of European Wildlife and Natural Habitats and the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere as examples of regional conventions. Further, international agreements such as the development of a river basin or hydroelectric installation covering several countries must also be taken into consideration.

h) Social and cultural influences

In arriving at decisions when formulating and executing a forest policy one must consider the social and cultural acceptability of the decisions by individuals and groups within the country. These influences are so diverse that it may be better to subdivide them into the following categories: customs and traditions, type of land ownership and rural structure of the country. (See Fortmann and Riddell, 1985, for numerous references on the subject).

- (i) Customs and traditions can be a major consideration, especially in rural areas with populations having long established cultures, traditions and religious practices. Examples of customs and traditions of the population which exist in some countries in the use of forests and forest lands that can influence a forest policy are: the customary use of forest fires to improve pasture for domestic animals; the accepted custom of open or uncontrolled grazing of forest and wild-lands regardless of the owner; the unrestricted collection of fuel-wood and other forest products by the public on state lands.
- (ii) The type of land ownership may be completely governmental, as in a socialist state, or a mixture of state and private in varying proportions in societies of a more capitalistic structure. Forest policies will have major differences in the two socio-economic systems.
- (iii) As an example of the influence of the rural structure, consider two extremes. The rural structure may consist of large properties or latifundia in the hands of a few owners as is the case in many third world countries, especially in Latin America. In this case, forest lands probably consist of a limited number of holdings, each of an extended area. At the other extreme, the rural structure may consist of many small-sized properties and forest areas with a large number of owners as in the Scandinavian countries. Another rural structure occurring in a number of countries, particularly in Africa, consists of tribal or communal ownership of the land. Obviously, there will be differences in the forest policies of the three cases.

Whatever decisions are taken, one must consider their social and cultural acceptability. Rarely will they be acceptable to everyone. For example, policy changes which prohibit open grazing, which expropriate private forest lands to establish a state forest patrimony or institute a land reform policy to break up large estates will inevitably result in a collision of interests. The existence of possible conflicts does not mean that the controversial decision should be avoided. However, the policy maker should recognize the potential dispute and enter it into his evaluation of the merits and demerits of the question.

i) Policies of private owners

Forests and wildlands may be owned or controlled by individuals, corporations, institutions, cooperatives and other associations of various types. These owners may have their own explicit or implicit forest policies or other policies which are related to forestry. These policies may vary among themselves, i.e., each of these entities may have different sets of objectives and activity programmes. Their policies may also differ from government policy, to the extent there is no legal conflict. For example, a private forest industry could not have a policy of clearcutting its timberlands if official government policy (with the relevant legislation) forbid this method of cutting.

The objectives and activities of the policies of these owners must be taken into consideration in the formulation of government forest policy. The desirable situation would be that these policies provide ideas, experience and evidence of value in the formulation and execution of official policy and that they do not conflict with it. However, at the other and negative extreme, they may be considered erroneous, destructive and counter to the general welfare and this can act as a stimulant for corrective decisions and actions in government policy.

6. Policy Evolution

A policy at any moment is an expression of a number of decisions which were taken based on the existing environment at the time the policy was formulated. But the policy environment is a mutable, dynamic set of influences and criteria. The details and contents of these categories of influences have undergone changes in the past and will undoubtedly undergo changes in the future. The main issues which must be confronted in formulating a policy (see Chapter II) will also change as time passes. In other words, the policy environment will undergo an evolution with future conditions and issues different from those of today. This means that policies must be susceptible to change; they must be sufficiently flexible to permit their evolution according to changes in the policy environment and to the new issues which constantly arise.

Policy formulation and implementation can be considered as an incremental process whereby policy is added to, revised and evolved over time. It is an evolutionary progression which undergoes constant revisions, additions and deletions. There can never be a final, definitive and permanent policy since the influences and criteria of the policy environment are continually changing as well as the policy makers.

## II. OBJECTIVES

### 1. Objectives as the Foundation of Forest Policy

As shown in Fig. 1, the foundation of a forest policy is a clear understanding of what its objectives are; in other words, what the forest policy hopes to attain or achieve. The objectives may be formally stated in a document and this explicit presentation has the advantage of being available for reference, scrutiny, debate and general understanding. Objectives may also be implicit or can be interpreted from the other elements of a policy (from legislation, organizational structure, programmes). However, objectives in this form may not be easily recognized or are open to variable interpretation.

In a discussion of objectives as the basis for a forest policy, it is worth clarifying the meaning of the term. An objective, both for an individual and an organization, defines a state or condition which should be attained in a specified time or which can be maintained for a given period. An objective may be general or specific depending on the level of detail in a given policy. Objectives may be temporary, that is, they can be attained in a short period, or they may be fixed, that is established permanently or for long periods.

Objectives of a forest policy rarely exist alone or isolated; they are usually related to other more general or more specific objectives. They may be related to broader objectives at higher levels such as national, regional or international. For example, a national development policy may include objectives regarding national security and defence, health and welfare, maintenance of the socio-economic system, economic expansion, full employment, equitable distribution of income, etc. These are policy objectives of a more general nature but with an indirect effect on forestry. Forest policy objectives of a more limited and detailed character must be consistent and in harmony with them. These relationships are discussed more fully in Section 4 of this chapter on objective structuring.

### 2. Issues in the Choice of Objectives

It is impossible to recommend the objectives of a forest policy that are appropriate in all countries. As discussed previously, the objectives of a country's forest policy depend on influences and issues which vary in different parts of the world. Also, issues in relation to forest policy undergo changes as time passes. Thus, the last few decades have seen drastic technological, socio-economic and political changes that have affected forest policy. A recent FAO study has characterized the most important current changes affecting forest policy as population growth, economic expansion, continuing energy shortages and the increase in the use and dependency of wood for fuel, the increase in landlessness and the need to find additional sources of food. Other changes which have occurred include the increased demands on forest resources for non-wood uses, notably recreation, a growing scarcity of wood resources with price increase trends and the increased use of reconstituted wood products. Another far-reaching change has been the realization that forestry has an important social content and is not simply concerned with trees and converting them into physical products. This broader concept of forestry requires that all policy decisions: (a) consider the views

and interests of the population, and (b) try to incorporate the population in forestry activities which will benefit them, especially people and communities living in rural or forest areas. The pressures created by these changes have meant that older forest policies have been forced to evolve. Issues faced today differ dramatically in comparison to those of 50 or 100 years ago. In spite of the diversity of issues which must be faced, it is possible to establish a reference frame which should be considered in deciding on the objectives of a forest policy. In other words, the specific content of a forest policy can vary by country, but it is practicable to establish a list of the main kinds of objectives or principal issues which should be given consideration in the process of formulating a policy. The list of categories should not be considered exhaustive and may well be expanded as the horizons of forestry broaden. The most important categories of these that can serve as a guide in the formulation of a policy are listed below.

- a) Objectives related to the role of the forestry sector in the country's economy and social welfare.
- b) Objectives regarding the relation between state and private forestry.
- c) Objectives regarding the establishment, size and maintenance of a state forest and wildland patrimony.
- d) Objectives for the management of a state forest and wildland patrimony.
- e) Objectives regarding the management of private forests and forest land.
- f) Objectives related to forest industries and marketing.
- g) Objectives related to the establishment, use and management of national parks, equivalent areas and wildlands.
- h) Objectives related to the protection, management and use of wild flora and fauna.
- i) Objectives related to education and training.
- j) Objectives regarding research.
- k) Objectives related to extension and technical assistance.
- l) Objectives related to environmental protection.

Within each of these categories specific objectives may be defined whose content will depend upon the orientation of the government and the values and desires of the population. For this reason the detailed content of forest policies may differ from one country to another although there are certain objectives, mainly related to the need for the conservation of natural resources, protection of the environment and control of pollution that have generally been accepted independent of the form of government or its ideology. On the other hand, many objectives in a forest policy are generated by basic differences in the ecological, social, economic and political characteristics of the country.

For each of the categories listed above, differences of opinion may exist on the specific objectives to be established. Of course, some of the categories lend themselves to more debate than others but for all there always exist alternatives or variations. The choice of an objective will depend upon the opinions and views of the policy-making participants (see Section 4, Chapter I), which will be formed by the influences and criteria described in Section 5 of Chapter I, "The Policy Environment". The actual choosing of forest policy objectives is most often an unstructured and accumulative procedure which is stimulated by:

- Decisions on broader-scope national policy issues which require the definition of more specific forest policy objectives. For example, a national policy regarding the use and conservation of natural resources would necessitate the definition of policy objectives for the forest resource as a component of the more comprehensive resource policy.
- The recognition that some kind of forestry-related problem, difficulty or uncertainty exists and a decision is required on what position the government should take to confront, solve or alleviate it.

The following paragraphs present some of the most important issues and questions which have been frequently considered, discussed and debated in arriving at declarations of the objectives for each category. The issues discussed under each category should be viewed as examples and many others of a more specific nature could well arise in different countries and at various times.

a) Objectives related to the role of the forestry sector in the country's economy and social welfare 1/

In countries with sufficient forest resources, the state may try to increase their actual or potential contributions to the national economy and welfare considering the inclusion of the following objectives:

- (i) Should the state have as an objective the achievement of an integrated rural development, including forest management and utilization, in harmony with agricultural activities, the use of water resources and protection of the environment?
- (ii) Should the state have as an objective the improvement of communications between the forestry sector, other sectors, financial institutions and the public in general?
- (iii) Should the state stimulate forestry activities which will generate employment, increase income and raise the standard of living of the population, especially in rural areas? If so:
  - Should the state utilize credits, subsidies and the reduction or postponement of tax payments to encourage the establishment or expansion of industries?

1/ For a discussion of the role of forestry in rural development see FAO (1983). See de Camino (1985) for a comprehensive treatment of incentives in conservation programmes.

- Should the state encourage and assist in the establishment and operation of institutions or organizations at the local level capable of managing forestry programmes and distributing equitably their benefits?
- Should the state institute reforestation and silvicultural treatment programmes which will provide employment as well as improve the quality and growth rate of the forest?

(iv) Should the state encourage and stimulate agroforestry to increase and diversify both forest and agricultural production and control land degradation?

- Should the state provide programmes of technical assistance, marketing services, supplies and credit to individuals and communities to encourage combinations of agricultural, livestock and forestry production?

(v) Should the state provide or expand public services such as electricity, sanitation, water and education to rural communities dependent on forest and wildland activities to raise the standard of living and discourage migration to urban areas?

(vi) Should the state have as an objective the increase in the supply of wood or derivatives for fuel, through plantation establishment and better natural forest management to meet the country's energy needs?

(vii) Should the state try to improve environmental conditions for the country's urban and rural populations by better management of the forest and wildland resources and reduction of environmental pollution?

(viii) Should the state encourage and assist individuals and communities, especially in rural areas, to carry out forestry programmes on private and communal lands for the production of fuelwood, fodder, building materials, etc. to satisfy local needs?

(ix) Should the state stimulate the integration and social development of indigenous communities contributing to their organization and economic and social improvement through mechanisms that will encourage productive forestry related activities?

(x) Should the state stimulate activities which will contribute to the food supply, utilizing meat from wild game and minor forest products such as edible fruits, leaves, roots, mushrooms, etc.?

b) Objectives regarding the relation between state and private forestry

A forest policy should define the responsibilities and role of state and private forestry and the ownership of forests and forest lands 1/. A multitude of questions may arise in deciding upon this objective. Any decision must first consider if there exists the right of private, communal or tribal property. This is a prerequisite with fundamental social and economic implications for the country far beyond only forest policy formulation.

Assuming the right of private or communal ownership exists, shown below are some of the most important questions which must be confronted in defining the objectives for the relation between state and private forestry.

(i) Should the state be responsible for all actions in forestry development or should they be limited to certain functions?

- Should the state undertake productive activities such as forest exploitation, manufacture of forest products and their sale or leave this to private interests?
- Should the state assume the responsibility for protecting private forests as well as those of the state or should this be completely the responsibility of the owners?

(ii) Should an objective of the state be to transfer the maximum possible of publicly-owned forest (and wildlands) to private owners? (See Deacon and Johnson, 1985 and Stroup and Baden, 1983 for interesting views on the question). Should this transfer be limited to citizens or be permitted to foreign individuals and corporations?

(iii) Should some percentage of state-owned forest (and wildlands) be converted to agriculture or other uses?

(iv) Should the state produce planting stock for forestation and reforestation or should this be left to private initiative?

c) Objectives regarding the establishment, size and maintenance of a state forest and wildland patrimony

A state forest patrimony consists of forests, forest lands and, with increasing frequency, of wildlands which are under the management of the state with the intention of remaining so permanently. The term "patrimony" is flexible and the characteristics and names of the included units of land may vary in different countries. For example, a patrimony may consist of one or more of such classes of state lands as: forest reserves, national forests, national reserves, national parks, recreational areas, wild areas, protected areas, natural monuments, etc. In all cases, clear definitions of each class are necessary.

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1/ State-owned lands are defined here as all those under some form of governmental ownership, be it national, regional, provincial, municipal, etc. Private forest lands are those owned by cooperatives, tribes, religious organizations, individuals, corporations or other organizations and groups not forming a part of the governmental structure.

The first decision is whether or not to have a state-owned forest patrimony as an objective. In the majority of countries endowed with significant forest resources the decision has been positive. Only countries without forest resources of some magnitude have ignored or decided against the desirability of establishing a state forest patrimony. Assuming the decision is to have a state forest patrimony, what are the objectives of such a system? The reasons for establishing and maintaining a forest patrimony may vary. For example should they be:

- (i) Assurance of a sustained supply of raw material for industry?
- (ii) Exertion of an influence on quantity and prices of forest products?
- (iii) Prevention of destruction of forests and lands with negative effects on the environment?
- (iv) Provision of water supply for personal, industrial and agricultural use?
- (v) Protection of the headwaters of navigable rivers?
- (vi) Prevention of loss of genetic material?
- (vii) Provision of facilities for recreation?

Further, a decision is required on what should be an appropriate magnitude and composition of the country's forest and wildland patrimony. For example, should an objective be that the patrimony is: the majority of the country's forest and wildlands; a certain percentage of the total area for forest and forest lands of the country; or a maximum limit for state ownership? The advantages and disadvantages of public versus private ownership have been argued extensively. For a concise summary see Worrell (1970). An objective might be that the patrimony should include examples of all forest types and ecosystems and that there be a balanced geographic distribution in the country. Decisions on the magnitude of the state forest patrimony require that consideration be given to domestic and foreign demand for products and services, the productivity rate of the forest for these goods and services (e.g., per unit area yields of timber) and environmental concerns. If a state forest patrimony is to be established, one should recognize that a required ancillary objective is the physical identification and delimitation on the ground of the lands included.

d) Objectives for the management of a state forest and wildland patrimony

Originally, the idea of a state forest patrimony was restricted to an aggregation of forests or forest lands in the conventionally understood meaning of a forest, i.e., lands supporting associations of tree species that could supply wood as a principal product (without excluding other possible goods and services). There has been a gradual extension of the concept and a "forest" patrimony in many countries now includes wildlands which support shrub or herbaceous vegetation and even, sterile, bare land. Obviously, the kinds of land a state patrimony comprises will determine the objectives for their management. Two often stipulated objectives for the management of a state forest patrimony are multiple use and sustained yield. Needless to say, these objectives may also be valid for private forest lands. Other decisions are also required on other management objectives such as those regarding exploitation, regeneration, protection and trespass. Some of these questions are discussed below:

(i) Should an objective of management be multiple use? The term "multiple use" has been much in vogue in regard to forest land management. It expresses the concept of managing the renewable resources of forests and wildlands so that they may produce the goods and services of wood, water, wildlife, forage and recreation in such a manner and combination that satisfies the economic, social and cultural needs of the population with a minimum or acceptable deterioration of the resources. The explanation includes the following ideas:

- Forest and wildlands can produce a variety of goods and services and, often, it is possible to obtain more than one simultaneously on a specific land area by appropriate combination of uses.
- One must recognize that it is impossible to obtain concurrently a maximum yield of each of the potential uses. It is possible to increase and, perhaps, maximize the net sum of benefits from an area by means of a judicious combination of two or more uses.
- A compatible and harmonious combination of uses is in the public interest with the caution that a certain flexibility be maintained for future modifications and that there is a minimum damage to the resource.

The idea of multiple use appears simple and clear but the following points must be recognized in trying to apply it:

- The intent of choosing the optimum use or combination of uses for a given area seems eminently logical. However, the identification, measurement and comparison of costs and benefits related to different uses or combinations of uses with the intention of choosing the optimum alternative is extremely difficult. It is especially arduous if one tries to evaluate social, environmental, recreational and aesthetic costs and benefits. The greater importance currently being conferred on the intangible goods and services obtainable from forest and wildlands has given prominence to the dilemma of measuring their value (See Sinden and Worrell, 1979).
- Preconceived ideas and rigid points of view, including those of professional foresters, must be minimized in arriving at decisions on land uses. Consideration should be given to all potential uses without prejudices or favouritism.
- Not every unit of an area must play a multiple role; the multiple use concept relates to a total area and not necessarily to each unitary subdivision.
- Multiple use should be viewed as a dynamic rather than a static concept. Every effort should be made to maintain flexibility and reversibility that permits prior decisions on land use to be modified.

- The decisions that an organization or owner takes on the uses of its lands according to the principles of multiple use must take into account public opinions and views. This is of primordial importance in a public institution such as a government authority managing state lands. External public demands may be of lesser influence to a private owner but even here they may be important especially if the proprietor wishes to maintain good public relations and project a socially acceptable image.

(ii) Should another objective of management be sustained yield? The idea of sustained yield is based on the desire to produce wood on a continuous basis from a forest. (It can also be extended to include the provision of non-wood benefits). Sustained yield implies that an appropriately managed forest will provide a continuous annual or periodic yield equivalent to growth: young or immature trees would increase their volume while mature trees would be harvested.

The exact technique of management and the harvest cuts may vary but the principle is that the rate of harvest is equal to the rate of growth so that a sustainable, continuing yield is maintained. A form of sustained yield is called "evenflow". Evenflow has as a requirement that the annual or periodic production be close to equal or uniform.

For young, managed forests the application of the principle of sustained yield is relatively easy. Problems arise when one tries to convert old-growth mature or overmature, unmanaged forests to a managed condition with sustained yield. This is especially the case with unmanaged tropical forests and old-growth forests on the west coast of North America. Questions arise such as: Over what time period should the conversion process be spread? For what area should the balance between growth and cut be calculated during the conversion process?

The application of sustained yield to previously unmanaged forests in the less developed, tropical countries introduces an additional dimension to the problem. Trying to apply the concept of sustained yield to these forests means sharply limiting the exploitation of large areas, foregoing current income. Many, but not all, of these unmanaged tropical forests produce relatively small quantities of usable timber per unit area. It may be a wise economic decision to cut them at a rate greater than the principles of sustained yield would allow and regenerate them with faster growing and more valuable stands. Of course there are additional facets to the question. One must recognize that large-scale cutting of tropical forests may destroy valuable genetic resources of flora and fauna and also cause other negative environmental and social impacts such as soil deterioration and erosion and destruction of traditional cultures. Arriving at a judicious decision taking into account ecological, economic and social values is not an easy task.

- (iii) A decision must be taken on whether an objective of management is the production of wood and other goods or whether management should only be for protection, environmental benefits, recreation, etc. If management is of a productive type, should an objective be exploitation in the patrimony by the state or should this function be passed to private hands by means of timber sales, concessions, leases, permits, etc.? What should be the allowable cut? Further, should restrictions or limitations be established on methods of logging and in the construction of access routes? Should some portion of the state forest patrimony be preserved for wilderness and scenic values and withdrawn or be protected from any other use?
- (iv) Normally, an objective of production management is regeneration of the forest. Should there be limitations on the silvicultural systems used (for example, prohibition of the use of clear-cutting)? Should the objective be natural regeneration, artificial regeneration, combinations, native species or exotics?
- (v) Is protection against injurious agents such as fire, insects, diseases and animals an objective of management? In the protection and use of the patrimony should one include as objectives maintenance of the ecological balance, restriction in the use of insecticides and herbicides?
- (vi) Is an objective of management to permit opening of the patrimony to human settlement or, on the other hand, to prevent the illegal entrance and occupation of state lands? Especially in the less developed, tropical countries decisions in regard to these objectives are vital in the management of a state forest patrimony.
- (vii) Is an objective of management to permit or carry out profitable activities on the state forest or wildland patrimony which may cause destruction or severe modification of natural conditions? For example, should underground, surface, strip-mining and oil-well drilling be permitted? Should the waters from lakes or streams be used for irrigation or industrial purposes? In the less-developed countries the pressures for economic expansion may be so great that protection or conservation of the environment and natural resources are sacrificed. As countries become more developed and industrialized the tendency is to place more emphasis on ecological considerations since their economies are more diversified with alternative sources of income.

e) Objectives regarding the management of private forests and forest lands

The state may take an active or passive role in relation to the management of private forests and lands. (Note: this includes communal or tribal lands, where they occur). The extreme passive role would be to leave decisions and actions on the utilization of these natural resources entirely to the owners. The opposite extreme would be total supervision and control of the use of private forests and lands by the state. In most countries the role of the state falls somewhere in the continuum between these extremes. To decide on the relation of the state to private forestry it is necessary to consider the following objectives:

(i) Of the utmost importance; should the state have as an objective the control or regulation of the use and management of private forests and lands, including wildlands? Dowdle and Hanke (1985) have pointed out that, "Forest practices regulations have as their objective the mitigation of a number of environmental impacts associated with timber production and the maintenance of the productivity of forest land. They recognize four major areas of regulation: (1) road construction, (2) timber-harvesting operations, (3) the use of chemicals and, (4) reforestation 1/.

Should regulation be a function of the central government or delegated to local governments or political subdivisions? If the decision to utilize regulation is positive and legal in the country, the way is open to innumerable controls and restrictions in the use of these resources such as compulsory preservation of existing forest, obligatory inventories, the required preparation and approval of management plans, limitations on areas or quantities to be cut, requirements for silvicultural practices, reforestation and regeneration, control or logging methods, permits for felling, restrictions on rotation age and size of trees to be cut, etc.

(ii) Should the state have as an objective the identification or delimitation of private lands which should be maintained permanently as forest? Should the state use forest land zoning such as designating areas which must be maintained as forest and other areas for which other uses are permitted? This is related to the more comprehensive issue of whether or not the state should have as an objective the classification of land use capability as the basis for land-use planning.

(iii) Should the state stimulate the establishment of small-scale forest industries in rural areas to increase employment, stabilize communities and raise the standard of living of the rural population?

(iv) Should the state have as an objective the use of financial and other incentives to encourage forestry practices such as reforestation, regeneration, timber stand improvement and thinning on private lands? Should these incentives consist of some or all of the following?

1/ Hagenstein (1985) has pointed out that government regulation on the way private forest lands are used can be effected in various ways which may be ranked in ascending order of governmental influence as: technical assistance, economic incentives and direct regulation. He states that direct regulation can be applied by establishing performance standards or by design criteria. Performance standards define a result to be achieved (e.g. requiring an area to be restocked 5 years after cutting). Design criteria define what must be done to achieve a result (e.g. leave 5 seed trees per unit area when making a harvest cut.

- Cost-benefit sharing contracts
- Tax relief
- Subsidies
- Grants
- Contributions in kind (e.g. seeds, plants, fertilizers)
- Credit facilities (e.g. loans with reduced or no interest and grace periods)
- Technical assistance

What is an appropriate level of such support? It is worth mentioning that the state may also have as an objective the application of multiple use and sustained yield on private lands. (For an extensive discussion of different types of incentives see de Camino, 1985).

- (v) Should the state have as an objective the utilization of taxation as a means of compelling forest land to be used more intensively or efficiently?
- (vi) Should the state have as an objective the protection, or participation in the protection, of private forests and forest lands against fire, insects and disease?

f) Objectives related to forest industries and marketing

In defining its policy towards forest industries and marketing, the following issues must be faced:

- (i) What is the government's objective in regard to the ownership of forest industry? Should it be public ownership, private ownership or a combination of the two in some given proportion? Decisions on this objective are closely linked to the economic system under which the country functions.
- (ii) Should the state participate in the planning and realization of forest industry development (e.g., establishment, expansion, retrenchment) taking into account the characteristics of the forest resource, local population traditions, customs and employment needs?
- (iii) Should the state make available raw material from public forest and wildlands to private enterprises? If so, what should be the magnitude and method of making available this raw material from state-owned lands for private use?

- (iv) Should the state regulate or stipulate rules or requirements regarding exploitation and the use of raw material from privately owned forests and wildlands? The purpose of such an objective would be to maximize the utility of the country's forest resources and maintain their productivity. To achieve this objective the state may stipulate rules or requirements regarding harvesting, such as minimum diameter cutting limits and stand age and quality, species and size restrictions for different uses such as pulp, sawlogs and veneer logs.
- (v) Should the state control the identification, classification and measurement of forest products? To achieve such an objective one might specify rules and regulations for the measurement of sizes and quantities of trees and their various products; the use of standard names and classifications for trees and forest products to avoid confusion and misunderstandings.
- (vi) Should the state regulate or control the transport, importation and exportation of forest products? Transportation control can provide information on the movement of quantities and types of forest products, allow the collection of taxes or tolls and permit the imposition of sanitary measures. In relation to import and export, the objective may be to allow, or encourage, unrestricted exercise of these activities or limit or prohibit them by means of tariffs or quotas. In a number of countries restrictions or prohibitions of log exports or imports of finished products have been imposed as a means of encouraging domestic forest industries 1/.
- (vii) Should the state control the prices of forest products? An objective of this nature must be in agreement with the general policy of the government. If some system of price control is used by the state this may or may not include forest products. Linked to this objective may be the control of wages of private forest and forest industry workers.
- (viii) Should an objective of the state be to improve privately owned forest industry installations and processes? If these are accepted as objectives the state may provide forest industry with technical assistance and financial incentives such as subsidies, equipment importation facilities and tax relief. In considering such an objective, knowledge of the availability of raw material is essential. There is little point in encouraging forest industry expansion if raw material supplies are inadequate to assure permanence and stability.

1/ See Wiseman and Sedjo (1985) for a summary of the advantages and disadvantages of such a policy objective.

g) Objectives related to the establishment, use and management of national parks, equivalent areas and wildlands

A forest policy may include objectives relative to the establishment, use and management of national parks, equivalent areas and wildlands if these areas are included as part of the forest sector. Some countries treat lands of this type as being outside the realm of forestry and consequently do not embody them in a forest policy. Whether included or in a separate policy, it is advisable that all countries develop a system or network of protected areas to meet its conservation requirements. This should include an explanation of the reasons for establishing these areas and statements of the objectives for their use and management (See FAO, 1974).

It is necessary to recognize that various types of lands can be included under this category (See IUCN, 1978). The development of an acceptable definition of categories of protected areas is a continuing concern of the IUCN. The concept of a national park is widely utilized although its precise definition and characteristics are not universally agreed upon. In addition, "other equivalent areas and wildlands" can have widely varying meanings. These equivalent areas may consist of such land units as natural monuments, natural reserves and wilderness areas. The objectives for each of these units may be different and should be specified. The following are important questions in defining objectives for the management of these lands:

- (i) Should units of national parks, equivalent areas and wildlands try to represent all the natural ecosystems that exist in the country? Should there be an effort to achieve a balanced geographic distribution of the areas?
- (ii) What should be the main objectives of each of the types of land: recreation, education, investigation, conservation of genetic resources, tourism, etc.?
- (iii) Should the areas be maintained in their natural state allowing the forces of nature to act without intervention, e.g., no effort at control of fire, disease or insect damage? On the other hand, should protection and control be exercised against natural injurious agents?
- (iv) Should visitor facilities (lodging, restaurants, shops, ski areas, etc.) be allowed within the limits of the areas or restricted to outside their boundaries?

h) Objectives related to the protection, management and use of wild flora and fauna

Objectives regarding wild flora and fauna may be considered in formulating a forest policy. Traditional forestry has been primarily concerned with timber production and other forest components have been given peripheral or minor attention. With the increased use of forests and forest lands for non-wood purposes, the associated plant and animal species have assumed a more prominent role which should be recognized in a comprehensive forest policy. Some objectives to be considered are:

- (i) Should chosen species of flora and fauna be protected from destruction or exploitation for their usefulness, scientific, aesthetic or cultural values or danger of extinction? Protection of fauna is usually carried out by control of hunting with special emphasis given to species in danger of extinction. Protection of chosen species of flora can be attempted by prohibition of their exploitation although complete success is rare.
- (ii) Should an objective be control of national and international commerce in chosen species of wild flora and fauna? This objective is linked to the former but attempts control outside the forest or habitat of the species after it has been exploited.
- (iii) Should an objective be the increase and management of selected species of wild flora and fauna that have scientific, commercial or other values, in areas that have appropriate natural conditions? The achievement of such an objective must take into account the attitudes, participation and cooperativeness of the rural population living in these areas.

i) Objectives related to education and training in forestry

A forest policy may include the declaration of objectives regarding the education and training of forestry personnel at different levels. A first step in taking decisions on this point is to estimate the manpower requirements for a specified future. The intent would be to assure the availability of competent personnel to carry out the numerous and diverse activities in the state forest authority and in private forestry and forest industry. Some important issues to consider in defining educational and training objectives are:

- (i) Should the state establish and operate educational and training facilities and programmes at the professional, technician and forest or forest industry worker levels? In some or all?
- (ii) Should the establishment and operation of educational and training institutions be left to the private sector? If so:
  - (a) Should the state regulate or control curricula and numbers of students?
  - (b) Should the state provide financial assistance or incentives to the institutions?
  - (c) Should the state provide fellowships or financial assistance to students?
- (iii) Should the state forest organization have an in-service training or continuing education programme?

In the past, forestry education has concentrated principally on production and protection forestry and on wood utilization with little or no attention to the social influences and relations of forestry. Educational and training programmes should now consider inclusion of subjects related to forestry which have a social or human element such as community forestry, rural development, land-use planning, and agroforestry. The intent should be to combine the study of economic and social studies with those of a more technical nature to produce personnel, at all levels, able to understand and adapt themselves to the changing economic and social problems in forestry. Some forestry educational institutions have already recognized this and have modified their programmes accordingly. But many professional forestry schools still restrict their curricula mainly to the traditional technical forestry courses. Curricula modification in these institutions and in technical and vocational forestry training centres will be required to incorporate these newer concerns of forestry.

j) Objectives regarding research

The purpose of research is the provision of information and the development of techniques for the numerous facets of forestry and related activities. A forest policy may stipulate objectives regarding basic and applied research required for the better management and utilization of forest resources, national parks, equivalent areas and wildlife. In addition, research objectives may include the provision of information for forestry-related rural development in topics such as agroforestry, energy production and small-scale forest industries. Examples of questions to be pondered in arriving at objectives for a forest research policy appropriate for a country are:

- (i) What should be the role of the state in how forest and related research should be carried out?
  - (a) A complete government responsibility?
  - (b) A university responsibility?
  - (c) A division of responsibility with the private sector? What types of research should be carried out by the government? Should research coordination be a government function?
  - (d) Should the state take measures to orient research programmes, improve their planning and integration at institutional, regional and national levels?
  - (e) Should the state try to set priorities on types of research and projects?
- (ii) What government institution or institutions should have responsibility for research?
- (iii) Should the state encourage research by the private sector through measures such as grants, subsidies, tax relief and other financial incentives?

- (iv) What should be the level of investment by the state in forest research?
- (v) Should forest research be carried out as an independent activity or in conjunction with agricultural or other related research?

k) Objectives related to extension and technical assistance

Objectives regarding extension and the provision of technical assistance to individuals and organizations in the private sector must be weighed in formulating a forest policy. For example:

- (i) Should the state establish an extension programme to provide information on forestry and related natural resources to the private sector? If so:
  - (a) What should be the objectives of the programme? These may include: publicizing the country's forest policy, legislation and operations of the state forest authority; education of the public on the role and value of the country's forests and related natural resources and on the need for their wise use and management; provision of the results of research and technical information to interested parties by means of publications, meetings, demonstrations, radio and TV programmes.
  - (b) What organization should be responsible for execution of the programme? The state forest organization, or other organizations?
- (ii) Should the state establish and operate a technical assistance programme for the private sector to stimulate forestry development? If so:
  - (a) What should be the objectives of the programmes: training programmes; technical, legal and financial advice; market information; provision of physical inputs such as seeds and fertilizer; credit?
  - (b) Should technical assistance be provided to private individuals, corporations or to both?
  - (c) What organization(s) should be responsible for the establishment and operation of the programmes? The state forest authority? Other governmental agencies? Educational and research institutions?

l) Objectives related to environmental protection

Forestry activities, whether they take place directly in the field (e.g., cultural treatments, road building, logging) or in subsequent conversion or manufacturing processes (e.g., sawmilling, pulp and paper manufacture) inevitably have an effect on the environment. A forest policy must take cognizance of this impact in defining its objectives. Some questions to be considered are:

- (i) Should the state require an evaluation of the probable environmental impact of a proposed use or exploitation of:
  - (a) forest and wildland resources?
  - (b) non-renewable natural resources on forest and wildlands?
- (ii) If an impact study is required, should the state have the power to refuse or grant permission for use or exploitation on private lands?
- (iii) What organization(s) should have the responsibility for executing or requiring the preparation of environmental impact studies and in the granting and control of permits?
- (iv) Should the state adopt measures to control or reduce the emission of environmental pollutants which affect forest resources?
- (v) Should the state take action to restore degraded watersheds and control the process of desertification?
- (vi) Should the state participate and cooperate in international programmes and actions for better conservation of forest resources and protection of the environment?

### 3. Information Required for Decisions on Objectives

The specification of objectives for a country's forest policy should be based upon adequate knowledge of the forestry situation. A weakness often encountered in forest policy formulation is the lack of required information to make rational choices on objectives. This may be due to deficiencies in the statistical gathering and reporting machinery of the country which results in needed data not being gathered or processed. In some cases there may be secrecy in the conduct of government affairs and restricted information is not available to the policy maker or made available too late when it has become obsolete. The information necessary for rational forest policy decisions should be as complete as possible with a continuity of flow. The more information available, the better the decisions on the objectives. In all too many cases objectives have been copied from other policies or simply consist of conventionally accepted generalities or stereotypes. Objectives for a policy suitable to a given country should be based upon specific forestry information backed up by a breadth of general information. If little information is available, a policy must be general; as more information is acquired the policy may be improved and expanded in greater detail.

Of paramount importance in decisions on objectives is some knowledge of the forest resources of the country. This information should consist of estimates of forest and forest land area, location, forest types, composition, quantity, quality, growth and drain. If possible, this information should be categorized by land ownership, such as government lands, state forest patrimony, private individuals, tribes and communities, organizations and corporations. In addition the following information regarding forest utilization is most valuable:

- (i) Estimates of consumption of different kinds of forest products and services. Products may be of a subsistence type (e.g., fuelwood) artisanal, or from forest industry. Estimates of consumption from domestic production and imports are useful. Services include recreation, wildlife and environmental protection.
- (ii) Predictions of future supply and demand of different forest products, including non-wood goods and services.
- (iii) Structure of forest industry in the country: number, productive capacity, actual production by different types of forest industries, quantities and values exported of different products, estimates of raw material available for different kinds of forest industries.
- (iv) Information on proposals and feasibility studies for the establishment or expansion of different types of forest industries.

The process of choosing objectives for a forest policy is aided by additional, more general information related to the forestry situation in the country. If available, the following types of information are useful:

- (i) Data on factors which influence land productivity, e.g., climate, topography and soils.
- (ii) Land-use classification for the country.
- (iii) Demographic information: present population and its geographic distribution; labor force; trends or expected changes in population and labor force; per capita income.
- (iv) Socio-economic information about rural populations.
- (v) Patterns of rural land distribution.
- (vi) Trends in the consumption of different land-derived products, e.g., agricultural products, minerals.
- (vii) Time required for and production pattern for non-forest crops.
- (viii) Cost-benefit ratios of different land uses.
- (ix) Employment requirements for different activities; employment alternatives and their influence on the stability of the population.
- (x) Possibilities of industrialization of different land-derived products.
- (xi) The probable contribution of different types of land use to the country's balance of payments.
- (xii) Relationships of different land uses within and between sectors of the economy.

In any case, forest policy formulation should not await the amassing of all the information mentioned. Policy formulation can begin using the information which is available. Obviously, the degree of detail and confidence in the choice of objectives will be proportional to the amount and reliability of the information available. Policy objectives based on relatively little information must be general. As more information becomes available these objectives can be modified and refined.

#### 4. Objective Structuring

The overall or general objectives of a forest policy are usually couched in sweeping and even vague terms, often only expressing laudable intentions, e.g., management of government lands under systems of multiple use and sustained yield; stimulation of forest industry and export of forest products; protection of endangered species; the right for the population to live in an environment free from pollution; etc. Objectives in these terms provide a broad framework for a forest policy but they are not sufficiently specific to provide the basis for decisions and actions regarding the other elements of the policy system, i.e., legislation, organization, work programmes and budgets. They should be complemented with more specific, and even quantitative targets.

Objective structuring is a systematic and logical procedure for analyzing or deciding on the more specific objectives of a forest policy. An objective structure defines and relates the objectives of a policy carrying their definitions to a specificity necessary for purposes of legislative and action programmes. To be operationally useful, objective definition must continue to the level of setting targets whose accomplishment can be checked or tested. Targets are essential since they constitute the guides to deciding on legislation, organizational structure and action programmes and, subsequently provide measures to determine their effectiveness.

An objective structure consists of a series of levels at which the objectives of a policy can be stated. At each successive level in the structure the objectives become more limited and specific. At a first level there may be one single, overall objective summarizing the broad aims of the policy. This must be sketched in general terms to encompass all the diverse goals. There may be differences in opinion on the appropriateness of the ideas included in this statement or in the definition of any of the more detailed objectives which may follow. One must recognize that the selection and definition of objectives at any level of the structure is subjective and strongly conditioned by value judgements and opinions. This is but another way of saying what constitutes the goals of a forest policy for a government or an organization are subject to different interpretations, always keeping in mind that they must be practicable and achievable. Thus, in subdividing an objective at any level into a series of more specific objectives at a subsequent level, there are other possible objectives which may not be stated. It is entirely possible that someone might dispute what is presented, maintaining that an important objective has been omitted, or one shown that should be discarded. One of the main benefits of objective definition and structuring is precisely the resulting scrutiny, debate and revision of objectives.

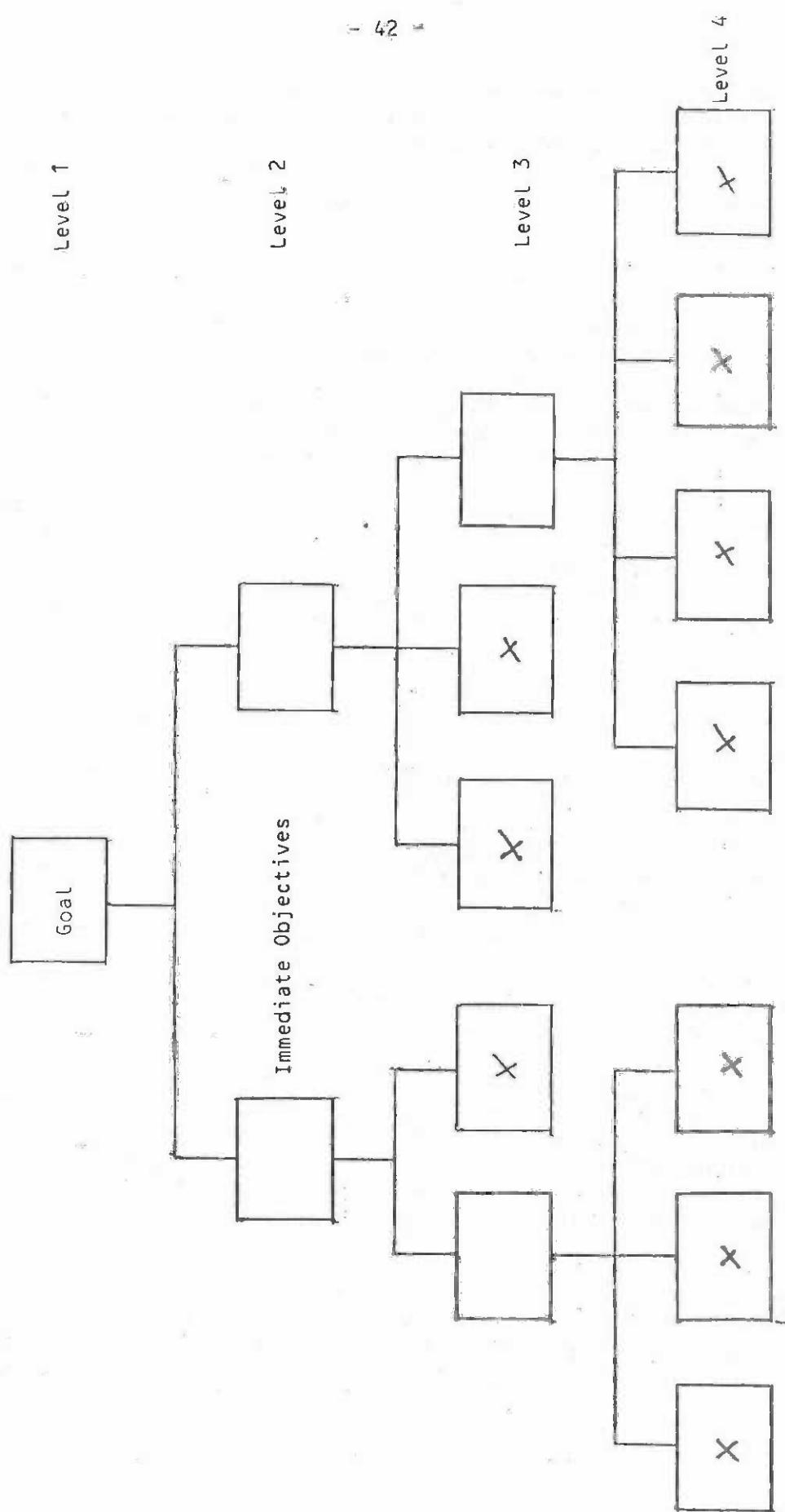
In describing objective structuring, a series of terms will be used which should be defined. The terminology presented here is somewhat arbitrary since other terms might be preferred by other individuals. However, for clearer understanding of the procedure of objective structuring we will adopt the following classes of objectives:

- (i) Goal. The overall or long range objective(s) of a policy. A goal will not usually be totally achievable by any single effort but may require the combination of many (legislation and action programmes) over extended periods of time. This category of objectives may also be called long-range or development objectives.
- (ii) Immediate objectives. The goal or long-range objective can be broken down into a series of immediate objectives each of which will fit within and contribute to achieving the stipulated goal.
- (iii) Targets. Targets are subobjectives into which the immediate objectives may be subdivided. They are more specifically defined, hoped for outcomes (also called working level objectives) which contribute to accomplishment of the immediate objectives and, in turn, to the goal of the policy. They are the expected results consisting of the formulation and operation of legislation and the execution of work programmes of the overall policy.

The achievement of the prime objective or goal of a policy means that a series of more explicit subobjectives must be accomplished. Thus a single overall objective (the goal) is successively broken down into more limited and precisely definable ones. Diagrammatically this can be illustrated as shown in Fig. 2. You will note that the accomplishment of a group of objectives at any level of the structure is equivalent to the achievement of the objective immediately above it in the hierarchy. In Fig. 2 are shown two objectives at the second level (the immediate objectives) whose accomplishment sums up to the achievement of the goal. These second level objectives are then further sub-divided into a lower echelon of third level, more specific objectives. This process of subdivision continues to a variable final level depending upon how specific one wishes to be in setting targets. The final level of the structure constitutes the targets or working level objectives. There can be no definite rule but the guiding principle should be to carry objective explicitness to the point where a few actions will permit target achievement. The ultimate level to which this process can be continued makes itself evident when a target can be accomplished by one single action. Indeed, if one goes this far, the objective and the action merge. In Fig. 2 the structure has been carried to a fourth level in some parts and to a third level in others. The targets or working level objectives in this structure are indicated by an X.

The development of an objective structure requires repeated questioning at each level in the hierarchy. Starting at the overall objective we must ask: "What does this mean? What has to be accomplished to satisfy this stated goal?" Answers to these questions permit increasing specificity in the structure.

Fig. 2 Objective Structuring



The targets are the determinants of the actions which will be required to put a policy into effect. To be of maximum utility these targets should be realistic and sufficiently descriptive to indicate the actions needed. Many instances will occur where targets for a period will be repeated for subsequent periods. When using the objective structure to prepare work programmes, it is helpful if targets can be stated in quantitative terms such as number of people trained, volume of timber harvested, kilometres of road built, number of hectares planted, etc.

It is important that the objective structure be not viewed as a flow chart; rather it is a logical tree showing the relationship of ideas, not actions. The order or arrangement in which the immediate objectives and targets are located does not imply or indicate their priority or importance nor the sequence in which they are to be achieved. The purpose of the structure is to identify objectives and not to assign priorities or to programme how they are to be achieved. The assignment of priorities and the carrying out of action programmes to attain the identified objectives is a subsequent exercise. At the same time, one must recognize that any of the objectives, at whatever level in the structure, can have an interaction or relation to any other objective. In other words, the objective described in each cell of the structure is not discrete but may have a relationship with or effect on some other objective. Understanding the existence of this interaction is important when one is considering priorities. Thus, an objective which has numerous interactions and relationships would probably have a higher priority than another with fewer ramifications.

It must be emphasized again that the objective structure is not concerned with how one arrives at specific ends but simply with the identification of what must be achieved. Fig. 1 shows that the actions necessary to achieve these objectives are taken at the following stages of the policy system.

The complexity of the structure which one wishes to present in order to explain the objectives of a government or organization is conditioned by the interests and requirements of the viewer. Thus, the public or top management level may only be interested in descriptions at the goal, or possibly, immediate objective levels. On the other hand, the operational staff of an organization which must put into effect a policy, would be concerned with more detail to guide individual actions and would be helped by explicitness to the target level.

An example of the structuring of objectives for a forest policy in a hypothetical country is given in Annex I.

As an aid to subsequent planning to put a policy into operation, it may be helpful to extract the targets and assign them priorities. Thus, some of the targets may be considered of greater importance than others and, if choices must be made, the lower priority targets would be considered first for modifications or elimination (always recognizing the effects this may have on higher level objectives). The assignment of priorities to different policy objectives is a difficult and often controversial task. Nevertheless, priority assignment is mandatory, especially in preparing an effective, acceptable and balanced programme of actions. A system which may be used in assigning priorities to policy objectives is given in Annex II.

### III. LEGISLATION

Legislation consists of the aggregation of laws enacted by the legislative authorities of a country over time, plus the common law and customary law which have accumulated respectively through judicial or traditional practice 1/. These laws try to ensure that the population acts or conducts itself in accordance with the body or rules and requirements contained in them.

Legislation provides the legal instruments which are necessary to put into effect many of the objectives of a forest policy. It permits the translation of the objectives of a policy into specific legal provisions affecting the use of forests, forest lands, wildlands and the way these resources enter into the life and development of communities, regions and nations. At the same time, it should be remembered that legislation is but one, and not always the most important, means through which forest policy is implemented. Since policy objectives change and evolve as the years go by, new laws must be enacted frequently or older ones revised or abrogated to be consistent with these changes.

Laws may be enacted by a legislature consisting of representatives elected by the population, appointed by a supreme government or some combination of the two forming a legislative body. Under some authoritarian governments legislation may be decreed by the higher authorities, possibly assisted by some type of advisory group but without a freely elected legislature representing the general population.

As shown in Fig. 1, the legislative process and the legislature or law-making authority is a part of the policy system. A legislative body can act in two ways in the system. First, it can enact or revise legislation in keeping with policy objectives requiring that government agencies and their personnel and the population carry out certain actions and, secondly, prohibiting them from carrying out others. The legislative body, in addition, can control the actions of governmental agencies by granting or withholding financial appropriations.

A legislative body has no means of enforcing laws. This responsibility is assigned by law to an existing executive government agency or to one created especially for that purpose.

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1/It is important to recognize customary law, taboos, religious and seasonal restrictions and observances when forest legislation affects the legal rights of indigenous people in rural or forested areas. As described by Cubbage and Siegel (1985), "Common law..... includes law created by the courts as they decide disputes brought before them. Each decision becomes a precedent for the guidance of courts in deciding future and similar cases. In general, this method of decision is used in the absence of a relevant written law".

A question of fundamental importance to forestry is how far should the state go in regulating the actions of private landowners? In practically all countries which permit private ownership of land, it is accepted that the owner has exclusive but not absolute rights to the use of his land. These rights are always limited and subject to the interest and general welfare of the nation. The state, in the interest of the health and welfare of society, can, by the use of its police powers, place some restriction on how owners may use their land. The owners usually have usufructuary rights which allow them to use their land as they wish providing they do not damage or destroy it or affect other lands, resources and uses.

#### 1. Functions of Forest Legislation

Forest legislation as a means of contributing towards the achievement of policy objectives affects both governmental agencies and the general public.

In regard to governmental agencies, legislation stipulates the responsibilities and actions which the agency and its personnel are instructed to carry out and explicitly or implicitly, the limits of its authority.

Forest legislation directed towards the public functions in three ways:

(i) By establishing laws, with sanctions for violations, prohibiting, limiting, requiring, or regulating actions relative to the exploitation, utilization, transport and marketing of the goods and services derived from the forest resource. E.g., no trespassing, prohibiting use of fires, restriction on cutting methods and the requirement to regenerate exploited forests.

(ii) By laws which encourage certain voluntary actions usually involving a reward or gain on the part of the user or observer of the law. The gain may be economic through tax relief or financial subsidies for such activities as tree planting, timber stand improvement and carrying out research 1/. On the other hand the reward may appeal to the emotions, sentiments or moral obligations of the population through the feeling of making some valuable contribution to society: no littering in wild areas; don't discard cigarettes or matches which may start destructive forest fires.

(iii) At times the absence of legislation will also contribute to the achievement of an objective. For example, if the intent of a forest policy is to allow the export of forest products in any form, then the absence of restrictive legislation on exports will be conducive to achieving this objective. If there is a prospect of economic gain or profit for actions by the population which are in accord with policy objectives, this incentive may be sufficient so that no legislation is required.

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1/ Bombin (1970) has summarized these incentives as:

- (a) Subventions: donations or grants of plants, materials, physical infrastructure, funds and technical assistance
- (b) Credits
- (c) Exemptions from or reductions of taxes

Older forest legislation was principally of the first type, i.e., restrictive or repressive. Subsequently, more modern legislation has added the second orientation trying to induce or promote actions in accordance with policy objectives. For an interesting discussion of the evolution of forest legislation see du Saussay (1985). In general, formal laws must be imposed if other means of contributing towards objective achievement are insufficient. However, it is advantageous to maintain, reduce or limit new legislation to the minimum essential and which can be enforced.

Adapting the explanation of Cano (1975), forest legislation contributes to policy objective achievement by regulating: (1) relations between persons (with respect to natural resources); (2) relations between the government and users of the resource, (3) relations between persons and resources in establishing how the former use the latter, and (4) the internal activity of the government in relation to publicly owned resources.

Considering only forests and forest lands, legislation recognizes two broad classes of tenure: private holdings (individuals, communal ownership, corporations, institutions, etc.) and some form of public ownership (central government, states, provincial, municipal, community, etc.) For an extensive bibliography of annotated references on land tenure and its relation to forestry and agroforestry see Fortmann and Riddell (1985). For private holdings the main purpose of legislation is to control, restrict or influence the way this property may be used so that it will not injure the property rights of others and to assure that the broader public interest is protected 1/. For public ownership, legislation tries to stipulate the way the land should be managed, used and protected for the benefit of the general public or some designated portion of it. Private use may be permitted subject to meeting contractual or legal conditions specified by the government 2/.

Most countries, including those in the developing world, at present have enacted some form of forest or forestry-related legislation. For a discussion of trends in forest legislation in developing countries see Schmithüsen (1982). However, this legislation cannot be viewed as completely satisfactory nor a static, once and for all, effort. Much legislation still requires improvement and modifications due to deficiencies in implementing current objectives, modifications in policy objectives, varying social and economic conditions with time, changes in the status of the resources, technological advances and, of recent and growing importance, changes in the concept of what the scope of forestry is.

1/ As Cubbage and Siegel (1975) have pointed out, "The police power exercised by the state to protect the public health, safety, morality and general welfare should not be confused with eminent domain. Under eminent domain, property is taken for a public purpose and just compensation is paid".

2/ For a detailed treatment of methods of disposal of timber in publicly-owned forests see Schmithüsen (1971).

## 2. Impacts of Other Laws on Forest Policy

Forest legislation should be viewed as part of a broader legislative corpus covering the use of natural resources. Fig. 1 shows that forest legislation must take into account and be in harmony with other legislation which has a relationship to forestry activities. Legislation regarding land use, zoning, agricultural and rural development, taxation, industry, among others, have close connections with and strong influences on forest laws. At times these laws may be at odds with forest policy. For example, taxation laws on forest land principally concerned with raising revenue for the state can be inconsistent with a country's forest policy that aims at encouraging reforestation and long range forest management.

G. Moore, in an unpublished FAO document has summarized the impact of non-forestry laws on forestry. He is of the opinion that of all laws outside forestry legislation, *per se*, the most important having an effect on the forestry sector is that relating to land tenure. Tenure laws affect (1) who owns the land: the state, private individuals, corporations, , etc. (2) the way these lands should be used, managed and protected and (3) the size of individual land holdings and the way changes in land tenure can be accomplished including expropriation by the state.

He also emphasizes the importance for forestry of legislation dealing with land-use planning although legislation of this type is still not widely in use. Land use planning, if employed, will have a fundamental impact on forestry since it deals with the issue of allocation of land to different uses.

In addition, he points out that fiscal laws have two major impacts on forestry. The first occurs when fiscal measures are used to promote the objectives of forest policy: these include application of taxes to discourage some action or relief from taxes to encourage others. Thus a tax may be placed on building on forest land or converting it to some other use with the objective of maintaining the land as forest. Tax relief, on the other hand, may be used if an institution invests in reforestation or in carrying out forest research.

The second fiscal impact is unintentional or the side effect that laws enacted to achieve an objective in another sector have on the forestry sector. For example, a law offering an incentive for human settlement on state-owned forest land may actually result in the destruction of forest resources without achieving the intended goal of establishing prosperous agricultural communities. This has occurred in some tropical countries where forest lands unsuited to permanent agriculture have been converted to small agricultural holdings with the encouragement of the government.

Laws regarding governmental reorganization such as decentralization may also affect forestry, with possible positive or negative results. In a positive sense, decentralization laws can have a favourable effect by making forest administration more responsive to local conditions. It may also have a negative effect by allowing more latitude to local forest administrators in taking decisions which may not be coherent or in accordance with overall policy.

### 3. Deficiencies in Regulatory Forest Legislation

Population growth, increased demand for forest-derived products, the opening of new roads, improvements in the means of transport and establishment of human settlements in forest areas have contributed to an increase in forest exploitation, destruction or conversion to other uses. In a number of the lesser developed countries, especially those in tropical areas, the legal and administrative structures are inadequate to control and regulate these activities. In many of these countries remnants of legislation from colonial periods are still in effect or have influenced more recent laws which are not in accord with changed social, economic and technological changes.

There has been an awakening in the last few decades in these countries, as well as in the more developed ones, of the need to control forest exploitation and environmental degradation with its concomitant erosion, loss of soil fertility, floods and extinction of species of flora and fauna. As a result of this recognition, many countries have formulated or revised legislation to control the use and exploitation of forests, forest and wildlands and to stimulate a new and broader approach to forestry development.

However, in spite of these legislative advances, inadequate management and destruction of these natural resources has continued, indicating deficiencies both in the legislation and in applying it. The main causes of these deficiencies are summarized below as political and legislative, socio-economic and institutional.

- a) Political and legislative. These are defects caused by decisions on policy objectives and deficiencies in the preparation of legislation.

They include:

- The lack of clear forest policy objectives or frequent changes in them. In too many instances forest legislation has been formulated without first having gone through the exercise of determining forest policy objectives. As a consequence, attention has been concentrated on stipulations and legal details without having first decided what objectives the law is trying to implement.
- Legislation related to forestry considered as of lesser importance than that pertaining to other activities such as agriculture or mining.
- Decisions on forest legislation affected by political exigencies counter to technical forestry indications.
- Incomplete, uncoordinated and contradictory laws causing confusion.
- Incompletion of the legislative sequence of law enactment followed by complementary regulations, ordinances or rules to put it into operation.
- Laws or regulations which are impractical, inapplicable or not enforceable.

- Continuation of obsolete laws which are no longer appropriate or in conflict with subsequent legislation.
- Lack of legal specialists with knowledge of forest legislation and sufficient comprehension of technical forestry subjects within the government and of service to the public.
- Insufficient collaboration of technical forestry personnel and other related specialists in the preparation of forest legislation.
- Ignorance of the forest resource (location, area, quantity, composition, growth and drain) in preparing legislation.
- Delays in, or non-incorporation of, technical forestry advances in the legislation.
- Lack of consideration of the social aspects of forestry.

b) Socio-economic. These are deficiencies due to ignorance, non-observance or conflict with legislation on the part of the population.

They include:

- Primitive cultural level, rigid customs and illiteracy of the population, particularly in rural areas.
- Existence of an indigenous population divorced from the cultural or economic life of the country.
- Low standard of living, extreme poverty and continual struggle for existence of a population more concerned with the basic needs of food and shelter rather than resource conservation.
- Lack of an ecological consciousness due to ignorance.
- Vested economic interests of powerful or influential elements of society with economic motives of immediate gain of higher priority than long-range environmental values.
- National educational programmes which pay little attention to ecological or natural resource subjects.
- Demographic pressure resulting in uncontrolled or spontaneous settlements in forest areas.
- Lack of consideration of the traditional rights or customary law of the population in forest areas.

c) Institutional. These are organizational deficiencies which result in poor or non-enforcement of legislation.

They include:

- Lack of a governmental forest authority.
- Weak government authority at a low level in the administrative structure.
- Dispersion in different ministries and agencies of forestry activities or related responsibilities with overlapping, jurisdictional conflicts, jealousies and confusion.
- Absence of appropriate courts of justice to impose rapidly and effectively the penalties for infringements of the laws.
- Low level of training of professional, technical and administrative personnel. Lack of educational and training facilities.
- Lack of instructions and directives to the personnel of the government forest authority on the interpretation and enforcement of legislation.
- Frequent changes in personnel and restructuring of the government forest authority causing variations in forest policy objectives and the effectiveness of the organization.
- Remoteness and inaccessibility of forests and wildlands making it difficult for the government forest authority to maintain personnel there to carry out its activities and enforce legislation.
- Lack of rural organizations, such as associations or cooperatives, to make the population aware of legal requirements.

#### 4. Changes in the Scope of Forest Legislation

In the past forest legislation considered the forest as primarily a source of goods and services used to satisfy human material necessities, principally wood, and to generate income to its owners (public or private) and to earn foreign exchange for a government by exporting its products. Such legislation may regulate exploitation and try to assure regeneration and good management of the resource but with the main interest in maintaining productivity, a supply of raw material and a source of income. Legislation of this type may ignore or give cursory recognition to the role of forestry in human development and as a component of a broader environmental system. This type of legislation usually does not cover national parks, wildlands or wildlife which are treated in separate laws. (See du Saussay 1980 and 1984, for discussions of legislation on wildlife, hunting and protected areas).

Recent forest legislation or legislation related to forestry has undergone two main changes. These are:

- Consideration of the relationship of the forest resource to the other components of the environment, i.e., soils, water, flora, fauna and the atmosphere. In other words, forestry as a part of environmental legislation. Frequently, national parks, wildlands and wildlife are included in this broader-scope environmental legislation.
- Integration of forestry activities into the social life of the nation particularly in the development of rural communities near or dependent on forested areas.

a) Forestry as a part of environmental legislation

In the majority of countries, earlier legislative efforts considered the forest as a distinctive and separate entity. Similar treatment was given to the other components of the natural environment of soil, water and air and their use, as in agriculture <sup>1/</sup>. This resulted in a series of separate, and in many instances, uncoordinated laws which did not recognize the concept of an environmental system. In the last few decades efforts have been made in several countries to include forests in broader legislation considering them as a part of a more inclusive natural environment or ecosystem. (See Cano, 1975 and Sand, 1972; 1977).

Efforts in this direction have been made as a result of the growing realization that in the environment everything is related to everything else. It is necessary to think in terms of ecosystems in which the forest or its subdivisions are but elements. The forest is a natural resource but further than that it is an environmental factor and as such is interrelated with all the other elements of the environmental system. As a consequence, anything that affects the forest resource will also have an effect on the soil, on the water regime, associated flora and fauna and, to a certain extent, on the atmosphere. Reciprocally, any changes in these elements will, in turn, produce effects on the forest resource. Given these inter-relationships and interdependencies, attempts have been made to formulate legislation which recognizes that the environment is a system of interrelated elements in which the forest resource is but one of several. The intent was to prepare a single, unified code covering all renewable natural resources. The first and outstanding example of this type of legislation is the 1974 Colombian law, Decree No. 2811, "Código Nacional de los Recursos Naturales Renovable y de Protección al Medio Ambiente" (National Code on Renewable Natural Resources and the Protection of the Environment).

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<sup>1/</sup> Cano (1975) pointed out that natural resources constitute but one of the elements of the environment. He has classified the total environment as composed of three categories: (1) the natural environment made up of the natural resources, (2) the created environment, i.e., things or institutions created by mankind and (3) the induced environment, i.e., the results of man's using the natural resources in agriculture, forestry, animal husbandry, pisciculture, etc.

Conceptually, there is much to be said for this approach. However, the formulation of environmental legislation which attempts to include all the elements of the environment and their use in a single, unified code or law is an extremely difficult undertaking. If the goal is a single, all-inclusive code the formulation task is formidable and extremely detailed, resulting in a lengthy and complicated law. Further, there is a tendency to try and establish a single governmental organization responsible for all the aspects of the environment. This may encounter opposition from the existing governmental structure and, if actually established, runs a high risk of inefficiency, conflict and gigantism when a single organization attempts to administer, numerous, disparate tasks. Prats and Speidel (1981) have also pointed out that certain parts of a code covering all natural resources may be less ready than others for legislative action. A single, unified code may lead to premature entrenchment of legal provisions before all issues have been analyzed.

Another course which seems well worth trying is to recognize the validity of the environmental system concept but to accept the necessity of managing and administering the various elements in a more pragmatic and workable form. A suggested way would be first to concentrate on formulating an overall framework of objectives for a national environmental or natural resources policy. This framework would include the broad objectives relative to each of the elements of the environmental system, stressing their interrelation. (See Cano, 1975, for a discussion of the legal aspects of natural resources management). Subsequently, the objective structures for individual policies covering each of the elements of the environmental system (i.e., soil, water, forest, air, etc.) would have to be in harmony with the overall objectives of the national environmental policy but obviously, going into much greater detail and specifics. The objective structure for each of the elements of the environmental system would then be used for the formulation of relevant legislation. This approach eliminates the need for a single, detailed environmental law, but at the same time, would ensure that there is concordance, coordination and a unifying goal for individual sectorial legislation for the various elements of the environmental system. A variation of this approach is to prepare a general organic natural resources law establishing a broad legislative framework, followed by the enactment of separate, subordinate legislation for the individual natural resources and their methods of use. The general law should not be too specific, leaving details to the subsequent legislation. This procedure is similar to the previous except that the framework is put into a law rather than left simply as a statement of policy. The Philippine Environment Code of 1977 and the 1982 Mexican Federal Law on Protection of the Environment utilize this approach.

It is worthwhile remembering that older laws, which may have been enacted for different reasons can be useful in the newer concept of environmental legislation eliminating the need for some new laws or reducing their scope. For example, an older law restricting discharge or dumping of waste and refuse may be applied currently in controlling environmental pollution.

b) Forest legislation for human development

In recent years, much greater emphasis has been placed on forestry as a vehicle for human development, especially for rural populations and communities living in close proximity to forest areas. Particular emphasis has been given to the management of state-owned forest lands so that local communities participate and benefit from the use of these resources. This has been the result of the concept of forestry for local community development and the promotion of local rights over forestry.

An unpublished FAO paper has indicated that forest legislation for social and human development should have the following characteristics:

- (i) It should be based on an understanding of the socio-economic considerations prevailing in the rural areas; that is, it should be based on an understanding of the way of life of the rural people, their needs, social customs, customary laws, income levels, political organization, and local capabilities.
- (ii) It should be positive in its thrust, providing motivation and incentives in support of local needs, while at the same time incorporating national policies, environmental standards and administrative support.
- (iii) It should be kept as simple as possible, both in substantive terms and in administrative requirements. The people must be able to understand the law and be able to comply with it within the framework of their local circumstances.
- (iv) Copies of the laws and regulations should be made available to local people in their own language.
- (v) The law should assign authority: who is responsible for what.
- (vi) The law should be designed to provide benefits to the most needy segments of the rural population, the benefits being commensurate with responsibilities.
- (vii) Enforcement of the laws and access to courts should be available at the local level.
- (viii) Legislation other than forestry laws should also be examined and revised as appropriate to support community forestry, especially laws relating to land, agriculture, resettlement, agrarian reform, soil and water conservation, environmental protection, institutions, grazing, women's rights and customary rights.

5. Basic Principles in the Formulation of Legislation

The fundamental principle in the formulation of any legislation is that it provides the legal tools needed to achieve the objectives of a policy. Keeping this in mind, the following criteria should be observed in formulating forest legislation:

- (i) First and foremost, the proposed legislation must be in harmony with the constitutional framework of the country and should take into consideration existing legislation related to the proposal.

(ii) The older concept of a forest law was much more limited than the flexibility required in more modern forest legislation. Formerly a forest law concerned itself principally with the following: the definition of the lands subject to the law (state, private and communal forest lands); the manner in which these forest lands were used; protective measures for these lands against trespass, illegal cutting, fire, etc.; definition of a state forest authority and its manner of financing; exploitation, industry and marketing of forest products; and finally, measures against violations of the law. The content of modern forest legislation is more variable and should be guided by the objectives of the forest policy which may include more topics than those just mentioned. In other words, the details dealt with in the law should be determined by the objectives (down to working level objectives, if possible). Although numerous authors have presented lists and outlines of what should be included in a forest law this is a restrictive recommendation not appropriate to the formulation of modern forest legislation. Since policies will vary it is not advisable to recommend a standard type of forest legislation. Modern forest legislation may deal with any or all of the categories of objectives described in Chapter II. This legislation need not be limited or compressed into a single law; rather, forest legislation may consist of a number of laws dealing with the different categories of policy objectives. However, an effort should be made to avoid having a multitude of fragmented or repetitive laws of limited scope with dispersed administrative and enforcement responsibilities.

(iii) Forest legislation should be practical and appropriate to the social, economic and ecological conditions of the country. The language used in the law should be simple and easily understood; complicated jargon should be avoided. Above all, the legislation should be enforceable. Laws which are not observed or cannot be enforced should not have been enacted. Non-enforcement not only brings the forest law into disrepute but also contributes to a more general breakdown in law and order.

(iv) A forest law should be the product of a comprehensive (and, if necessary, lengthy) process of meditation, discussion and debate in which the opinions and views of responsible and concerned members of the population are heard and considered. Hastily enacted legislation runs a greater risk of being inadequate or inappropriate with negative after-effects difficult to remedy.

(v) The writing of forest legislation should be a collaborative effort of technical forestry personnel, other professionals whose knowledge is required (sociologists, administrators, accountants, engineers, economists) for the law being prepared and legal specialists. Francois (1961) has stressed that the legal participants have a complete knowledge of the constitutional, administrative, civil and penal laws of the country.

- (vi) To facilitate application, the enactment of a law should be followed by careful preparation of subsidiary, more detailed and specific regulations, ordinances or norms. There are advantages of the basic law being kept general and details dealt with in subsidiary legislation. The framing of a single all-encompassing law which covers all possible points and situations is a most difficult endeavour. It is more practical for a basic law to be framed in broader terms and the necessary subsidiary legislation enacted subsequently to cover the more specific details. In addition, laws frequently require revisions or amendments as policy objectives, socio-economic conditions and technology change. Amendments to the subsidiary and more limited regulations, rules, ordinances or norms can be more easily enacted than making changes in a basic forest law.
- (vii) A glossary of the definitions of the technical terms used should be included in the legislation to avoid misunderstanding or misinterpretation.
- (viii) If a government forest authority is not already legally constituted, a forest law should specify the establishment of such an organization with descriptions of its assigned responsibilities and methods of financing. It is advantageous for the forest organization to be well placed and sufficiently high in the public administration structure.

#### 6. Use of the Objective Structure

The formulation of a clear and well-defined objective structure as described in Section 4, Chapter II, facilitates enormously the formulation or revision of legislation. The more detailed the objective structure the greater will be its usefulness in the analysis and formulation of legislation (or in the decision that no legislative action is required). A simple but rigorous system consists of meticulously analyzing existing legislation in comparison with the objectives of the policy utilizing a format such as that shown in Fig. 3. In the first column are entered each of the working level objectives extracted from the objective structure. To the right are a series of columns where individual or groups of the laws related to the forest sector are indicated and another column where the absence of any legislation may be noted. It is possible to group laws of lesser scope which treat of the same subject (e.g., numerous laws prohibiting the cutting or removal of certain species of trees or plants). Subsequently, each law or group of laws is assessed in relation to each of the objectives in the first column. If there is a provision in a law which relates to a specific objective, a brief mention is entered. If a law covers nothing relative to the objective under consideration the space is left blank. The penultimate column is used to comment if no law exists in relation to the objective but its very absence is conducive to the realization of that objective.

Following a complete analysis of all the legislation, it is possible to decide if the present legislation, or lack of it, is adequate for the achievement of the objectives of the forest policy. Probably one will find objectives for which legislation is needed and even legislation for which no objective has been formally identified. In addition, one can detect if there are repetitions or conflicts in the existing laws. Using an analysis of this type, present legislation can be revised, simplified, codified and gaps filled so that all the declared objectives in the policy which require legislation have the related legal instruments necessary to contribute to their realization.

Fig. 3 Analysis of Legislation in Relation to Policy Objectives

11/ These should preferably be targets or working level

## 7. Format of Forest Laws

No attempt can be made to describe or recommend the legislative process used to prepare a forest law since there is no standard or universal procedure. The proposing of a law and the subsequent process of finally arriving at an approved statute varies from country to country depending on the form of government.

In the same vein, it is not possible to describe or recommend a standard format for forest and related laws since various structures are used in different countries. The organization and sequence of its components can follow diverse patterns. However, laws are generally organized with a hierarchical structure. The names of the levels of the structure may be "parts", "chapters", "titles", "books", "sections", etc. but in most laws the final level of the structure consists of specific "articles". Regardless of the particular format used and the names and sequences of the components of the text, there is an underlying uniformity in the ways laws are constructed. An example of a structure commonly used consists of the following components:

- (i) Identification of the law (name, number, code, date, etc.).
- (ii) References to previous and related laws.
- (iii) Justification and reason for the law.
- (iv) Text of the law <sup>1/</sup>. The text consists of a number of articles which follow some grouping pattern in the hierarchical structure. The groups may be called parts, chapters, titles, etc. A simple structure might be a series of named chapters or titles grouping closely related articles. Typically, a text uses the following sequence:
  - (a) A first group of articles frequently defines the terms used in the rest of the law to avoid misunderstanding and misinterpretation of the subsequent articles. Some laws place this group of articles at the end of the text.
  - (b) A variable number of groups of articles dealing with the specific provisions of the law. Each group (title, chapter, etc.) is given a descriptive name.
  - (c) A group of articles dealing with infringements, penalties and their application.
  - (d) A group of articles covering general dispositions which were not covered in earlier articles. This may also include a stipulation regarding the duration of the law.

<sup>1/</sup>For a discussion of the content of the older type of forest law which considered forestry as primarily concerned with the production of timber and other goods, such as forage, see Francois (1961).

- (e) A group of transitory articles which have a fixed duration and are needed to allow a gradual and non-disruptive change from a current situation to a new one covered by the law.
- (v) The text of the law is usually followed by signatures of government officials indicating approval and enactment of the law.

#### IV. ADMINISTRATION

Referring back to Fig. 1 we can see that the structure and operation of a governmental forestry organization make up the two main elements of the administrative portion of the forest policy system. In other words, the forest policy system is not simply the setting of objectives and the enactment of legislation but must also include the operation of the governmental agency charged primarily with their implementation. Prats and Speidel (1981) have stated that, "The whole process of implementing a forest policy (achieving its objectives) consists of the functions and work performed by the staff of a given public forestry administration in a specified context, according to certain laws, regulations and manuals and using certain physical means. All of this must be reflected in the structure of the public forestry administration and its type of management, division of labour and allocation of responsibilities." This manual considers that forest policy implementation requires not only the actions of a public forestry administration as just cited, but also depends upon the collaboration of all the policy participants discussed in Section 4 of Chapter I. Although the principal actions to achieve the objectives of a policy devolve upon the state forest authority we must not forget that the objectives and programmes of other governmental agencies and activities in the private sector also share responsibility in implementing forest policy.

This chapter will concentrate on the role of a public forestry administration in the forest policy system, particularly in the effect of policy on management and in the formulation and revision of policy. Actually, a public forestry administration has a dual function: it operates as a policy implementation mechanism and at the same time as a contributor to policy formulation. As an implementation mechanism its organization and functioning depend upon the previously chosen policy objectives and legal mandates and powers assigned to it. Although its main task is to implement policy objectives, a public forestry administration plays an active and continuous second role in the clarification, determination and evaluation of these objectives. The staff of the organization, because of its specialized knowledge, training, experience and closeness to the issues, must become involved, together with higher levels of authority in the making and revision of government policy.

Since these two roles are so intertwined, the overall operational aspects of a public forestry administration must be understood in order to appreciate better the reciprocal effects of policy implementation and formulation. For this reason a brief introduction to administration and the management of a public forestry administration is given. However, no attempt will be made in this document to discuss in depth the principles for the administration of a governmental forest authority since these are better covered in the innumerable texts, documents, articles and journals which have been published regarding administration and organizational management in general and for governmental forest agencies. Rather, the material presented here will deal only with how a public forestry administration forms part of the policy system discussed in Section 2 of Chapter I and its role in policy formulation.

## 1. Introduction

Administration of any organization, be it public or private, refers to those actions necessary to achieve chosen objectives with the optimum use of time and limited human, financial and material resources. Public administration can be defined as the coordination of individual and group actions necessary to achieve governmental policy objectives in an effective and efficient way 1/. Administration is concerned with decision making and the direction of individuals and use of resources in an organization in carrying out its activities. Administration is primarily concerned with the means for achieving chosen ends although it also has an important part in policy formulation and revision.

The observation is often made that public and private administration are similar and that government would be more efficient if it adopted practices and procedures used by private business. To a certain degree there is validity in the statement. However, public administration differs from business or industrial management in a number of aspects. The scope of public administration is usually much broader and less well-defined than the latter. Objectives of a business or industry are more easily specified. Emphasis is primarily on productivity and return on the investment and results of activities are more evident and measurable. Public administration is more complex, depending on a diverse and broader series of objectives and legal requirements and restrictions aimed at the benefit of the public. The results of activities of a public administration are often less tangible and quantifiable although they may be of the utmost importance. Government activities are also carried out in a manner more visible to the public with a consequent greater susceptibility to scrutiny and criticism.

Efficiency refers to the relation between costs of carrying out a programme and the value of the benefits received. Efficiency may be achieved by producing a given benefit at a minimum cost or obtaining the maximum benefit at a given cost.

In any undertaking, there must be a central point exercising authority and responsible for the achievement of the chosen ends. To attain the objectives of a governmental forest policy, this leadership is carried out by a governmental unit which can be given the generic name of a public forestry administration (other synonymous names frequently used are state forest authority or government forest agency).

To be more specific, a public forestry administration can be described as that agency or group of agencies which have been assigned the main responsibilities and powers for carrying out those activities, in compliance with legislation, needed to attain the objectives of the government forest policy. In practically all countries there is a central government unit charged with forestry responsibilities. The name of such a unit may vary considerably including such titles as Forest Service, Forestry Department, Directorate-General of Forestry, Forestry Commission, National Forestry Corporation, Bureau or Division of Forestry. etc. However, frequently there may be other government agencies in the same country which also have forestry responsibilities.

1/ Effectiveness means the degree to which policy objectives or programmes are being achieved or the relative success of the policy or programme in accomplishing what it was designed to do.

For example, there may be state or provincial forest services as well as that of the central government. There may also exist governmental regional development organizations, which together with other functions, carry out forestry tasks. One may say that the aggregation of various public agencies which have forestry responsibilities really constitutes the organizational structure which functions to put a forest policy into operation.

It is difficult to generalize about the patterns or structures of forestry administrations in different countries. Differences exist even among countries with similar political systems or origins. Also, forest administrations in some developing countries, particularly in Africa and Asia, may be heritages of their colonial pasts. The structure and functioning of the forestry administration in any country is also influenced by changes in personnel, new problems, technologies and the march of events. All of these influences combine so that every country which has a forestry administration has evolved in a different way.

The operation of any organization requires a series of basic functions, the most important of which can be characterized as: decision making, planning, communication, commanding, executing, supervising, controlling, coordinating, cooperating, participating, educating and training. These are general functions required in any organization, public or private, for carrying out its responsibilities. In the operation of a public forestry administration, the implementation of these basic functions permeates all its activities. These more specific activities can be grouped as land management, regulatory, service and administrative and financial 1/.

Land management refers to that group of activities employed in managing a state forest patrimony or any other state-owned or assigned lands falling under the jurisdiction of the public forestry administration. These will include such activities as management planning, inventory, protection, silvicultural operation, exploitation, reforestation, etc.

Regulatory activities include the analysis, revision and formulation of recommended policy objectives and legislation; overseeing and supervising the observance and enforcement of laws and regulations pertaining to private forest lands and other natural resources which may fall within the ambit of the public forestry administration (e.g. wildlands, wildlife, national parks) and possibly, forest industries and marketing of forest products.

The service category includes activities of the public forestry administration in research, extension, educational programmes, and technical assistance to the private sector.

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1/ In those countries employing a federal system, some or all of these functions may be carried out by regional, provincial or state forest organizations reducing the responsibilities of the central public forestry administration.

Administrative and financial activities refer to the internal operations of the organization among which are planning programmes and budgets, supervision and control of programme execution, disbursement of funds, collection of revenue, acquisition and maintenance of equipment, machinery and supplies and training and continuing education of staff.

## 2. Organization and Structure in Relation to Policy

According to the policy system depicted in Fig. 1, a logical sequence would be that an organization is formed with the intention of carrying out activities necessary to achieve policy objectives. This situation would occur if no organization existed previously and it was necessary to establish one. To be realistic, this rarely occurs; it is much more common that there exists a previously established organization and subsequently activities and programmes are developed for it. At the same time the structure and functioning of existing organizations are not static and must frequently be modified to meet changing conditions. Consequently, it is well worthwhile to discuss briefly some important points regarding organization and structure 1/.

### a) Location of a public forestry administration

A public forestry administration in a government may be located : (1) in part a ministry or entity equivalent level, (2) in a separate forestry ministry or governmental organization at this level, or (3) in some form of public authority, corporation or autonomous agency.

If forestry is of major importance in the national economy, a separate organization at a high level may be established, such as a ministry of forests and forest industries. A public forestry administration may also take the form of some subordinate unit in the governmental structure, such as a department or service within a ministry.

The scope, diversity and importance of the activities which a state forest authority must execute will influence the type of organization and its location in the governmental configuration. The greater the responsibilities, the higher and more important the level the organization will occupy in the governmental hierarchy.

If not at a ministry level, a public forestry administration is best attached to a ministry or high level governmental organization which includes forestry responsibilities as an important component related to its other activities. A public forestry administration should not be assigned in a governmental structure to a location simply for reasons of tradition, balance or necessity to find a convenient niche. Since forestry activities have a close relation to agriculture, range management, soil conservation, water management and rural development, a common and logical solution has often been to locate a public forestry administration in ministries of agriculture, lands and water or natural resources. On the other hand, if forestry is assigned to a ministry where other interests such as industry, mining, human settlement, or tourism are of greater weight, then the goals and values attached to these other areas may be dominant and forestry may be downgraded.

1/ See Leslie (1980), for a discussion of institutions in relation to forest policy.

At times, a public forestry administration may be organized as an autonomous or semi-autonomous entity within a governmental structure. The intent and main advantages of such an arrangement are more flexibility in programme planning and execution and greater independence in obtaining funds and making expenditures.

A public forestry administration cannot be an entity unto itself. It must operate within an environment made up of other units in the governmental structure and also with external organizations. Within the government a public forestry administration must establish liaison and work with planning and budgeting agencies, with other departments of the agency in which it is located (e.g., other departments in a ministry of agriculture), with other ministries such as lands and human settlement, industry, public works, foreign trade, tourism and national defence and with regional or local public administrations. External organizations include forestry education and research establishments, banks, conservation societies and foundations, professional foresters' societies and forest owners' and industry associations.

Of primary importance is good cooperation between different units (ministries, departments, bureaux, etc.) of the government itself. Although the benefits of such cooperation are evident, it is often difficult to achieve, not because of structural or locational deficiencies but rather because of the human shortcomings of self interest and sectoral rivalry. Members of a given unit in a governmental structure often consider their sphere of activity or specialization to be more important than others and are reluctant to accept that it may have a lower level of importance or depends upon collaboration with other units for successful operation. The career development and grade of an official are often dependent upon the hierarchical position, jurisdiction and expansion of his organization and he may seek to push its pre-eminence at the expense of other subdivisions of the public administration.

b) Organizational structure

Structure refers to the design or physical arrangement of the units and personnel of an organization. It establishes the lines of authority and communication between the divisions and personnel and, consequently, the manner in which the organization functions.

Studies of public forestry administrations in different countries show a multitude of organizational structures 1/. An analysis of these structures shows that there is no one model which is universally appropriate or will ensure good administration. Since policy objectives, legislation and overall government structures differ by country it is not surprising that the compositions of their public forestry administrations reflect these differences and that many different structures have functioned quite successfully. Although there are many variations in their details, public forestry administrations are usually of the line, staff and line types or combinations and blends in some form of the two. For a brief description of these structural types with examples, see Prats and Speidel (1981).

1/ For comparative studies of public forestry administrations, including their organizational structures in selected Latin American, African and Asia-Pacific countries, see Prats and Speidel (1981), Palin (1980) and Adeyoju (1976). Although many changes have occurred since publication, examples of structures of public forestry administrations in Europe are given in FAO (1953).

It is well to remember that an effective public forestry administration cannot be constructed by concentrating on the development of a strong central organization and relegating the field or operational units to a secondary priority. To put into operation decisions made at higher levels, clearly, a strong on-the-ground operational structure is required. Usually, headquarters organizations (including provincial or other subdivisional headquarters) are stronger than field levels since more qualified, motivated personnel tend to be attracted there, salary levels generally are higher, better promotional opportunities may exist and greater resources are generally available.

The structure of a public forestry administration should not be deemed completely rigid or permanent. If policy objectives change or new legislation is enacted it may be necessary to modify the structure so that the new goals and responsibilities can be reached effectively.

c) Structure in relation to objectives and legislation

A requirement in the structuring of a public forestry administration is that there exist the units and their personnel needed to carry out activities dictated by the policy objectives and legal directives. This requirement can be accomplished by various organizational structures, i.e., line, staff and line or any of the possible variations.

The units of an organization may be constructed by grouping together activities: (1) with a related purpose or similar subject matter (silviculture, management of a forest resource, research), (2) using common procedures (a computational centre), (3) serving specific clientele (extension activities to the private sector), or (4) being executed within geographical limits. The structure of most public forestry administrations is determined by subject matter lines and geographical divisions. Using subject-matter criteria, expertise in individual specializations is grouped into structural units. Activities are then assigned to these units according to the subject matter for which it has competence and authority. In most cases, individual activities require competence which resides in a single structural unit and the execution of the given activity can be assigned logically to this unit. In some instances, activity execution can best be achieved by bringing together expertise from various structural units. For these multifaceted activities, it is logical to form working teams which cut across unit lines. Within the organization these teams may be formed by personnel from different headquarters and/or field units and may be temporary or permanent.

Since many activities of a public forestry administration are carried out on the ground, a subject-matter structure must be linked to a geographic structure. A much used solution is a headquarters structure based on subject matter and the primary field structure following geographical subdivisions. Each of the field divisions may also combine the subject matter and areal structures for executing activities.

Whatever the structural solution used, it must be in agreement with policy objectives and legislative requirements. A method of determining the adequacy of the structure in relation to objectives and legislation utilizes a matrix similar in concept to that described in Chapter II, Section 4, for analyzing legislation in relation to objectives. The idea is to determine if the organization has a unit or personnel whose activities are designed to contribute to the achievement of the chosen policy objectives and to meet legislative stipulations. Fig. 4 shows a method for analyzing structure in relation to objectives. The first column lists each of the working level objectives extracted from the objective structure (see Chapter II, Section 5). To the right area series of columns for each of the units in the organization. In the column for a given unit are described briefly each of the responsibilities in relation to the working level objectives. If a unit has no responsibilities for an objective the appropriate cell of the matrix is left blank. After an analysis of all the units it is possible to detect if there are units responsible for activities for each of the objectives. The analysis will show which units are working towards the various objectives and also, if there are objectives towards which no unit is working. Utilizing this type of analysis one may propose or revise an organizational structure so that there are appropriate units working towards the achievement of all the policy objectives.

A similar analysis can be made to check the structure in relation to the legislative responsibilities of the organization. A matrix can be prepared with a first column indicating all the legal responsibilities of the public forestry administration. This column can be prepared by referring to all the existing legislation related to the forestry sector and extracting the provisions which require the supervision or enforcement by the organization. Columns to the right would be designated for each of the units of the organization. Under these units would be briefly entered their responsibilities for each of the legal requirements. The analysis is similar to that previously described and will show the distribution of responsibilities or if there are gaps or overlapping in the assignment of these duties.

### 3. Management of a Public Forestry Administration in Relation to Policy

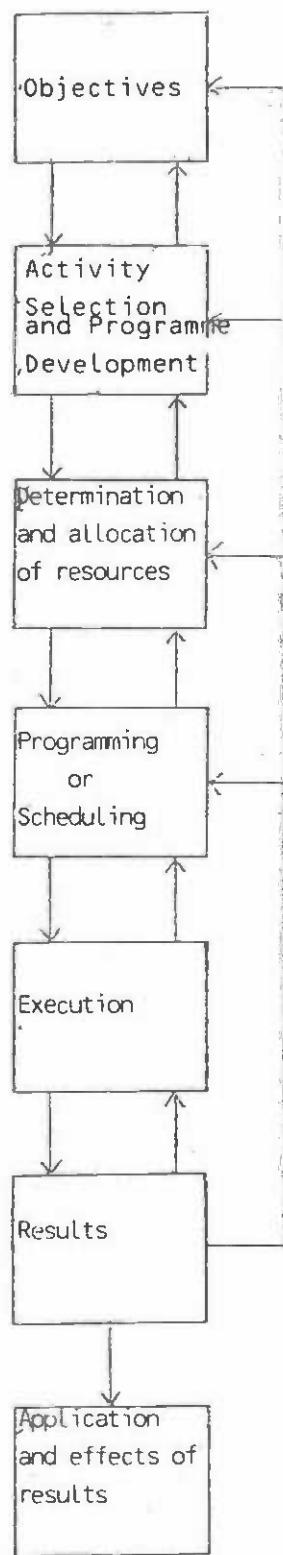
It should be evident that the management of a public forestry administration is a key element in the implementation of a governmental forestry policy and, also, in acting as a contributor to its formulation and revision. The place of a public forestry administration in the policy system has been shown in consolidated and abbreviated form in Fig. 1 where it consists of the two elements: structure of the government forest organization and planning and execution of its programmes. In this current section an endeavour will be made to show how the planning and execution element can be expanded into a subsystem which can be given the name of the management process. Thus the management of a public forestry administration forms a part of the total forest policy system. Since it is a part of this more comprehensive system, the components of the management process share the cyclical and reciprocal relations with all the other elements of the policy system. Similarly, the management of a public forestry administration functions within the policy environment described in Section 5 of Chapter I and management decisions will be influenced by the technical and political influences and criteria which constitute this environment.

Fig. 4 Analysis of Organizational Structure in Relation to Policy Objectives

Policy Objectives 1/	Description of unit responsibility in relation to objectives			Observations regarding adequacy of structure
	Unit	Unit	etc.	
1				
2				
3				
etc.				

1 / These should be the detailed working level objectives

Fig. 5 The Management Process



Just as the overall policy system was characterized diagrammatically in Fig. 1, the management of an organization can be viewed as a system made up of several elements. This system, or management process, shown in Fig. 5, indicates the logical sequence, relations, interdependence and the flow between the elements that constitute the functioning of the organization. The diagram shows that the first and most important requirement in the process is the choice and definition of the objectives which guide the organization. These management objectives of a public forestry administration must be dependent upon the broader policy objectives of the government. Basically, they are derived from the forest policy objectives and they must be consistent with and contribute towards the attainment of these higher goals. Policy objectives are more general while the objectives of management are more specific and are derived from the lower hierarchical levels of the objective structure described in Chapter II, Section 5.

If one analyzes and tries to utilize the objective structure of a forest policy, it becomes apparent that the objectives may be categorized as of two types which can be called strategic and operational. Strategic objectives set the goals for the nation and affect not only the governmental forest organization but also all components of the government and the private sector. These objectives are usually at the higher levels in the objective structure and they cannot be easily linked to specific activities aimed at their realization. Operational objectives, on the other hand, are those whose attainment can be achieved by carrying out specific activities. They are at the lower levels in the objective structure and are especially useful in choosing the management objectives and work programme of a public forestry administration.

Although the organizational objectives originate from those of the forest policy system, a public forestry administration, in the course of its operations may propose new policy objectives or revisions of existing ones. Naturally, these would have to be considered together with suggestions and requests from the other actors in policy formulation. The management objectives of the organization will also be strongly affected by the legislative mandates under which it has been established and must function. Here again, in the course of operations, the public forestry administration may find it convenient or necessary to point out the need for new or revised legislation and may be called upon by legislative bodies to cooperate in these tasks.

Returning to the management process, once the objectives have been defined, the next stage consists of determining activities and consolidating them into programmes required to achieve the objectives. The content of these programmes will be influenced by the other elements of the policy system as well as those of the management process itself. Thus the programmes of an organization will depend not only upon management objectives (which in turn are derived from policy objectives) but also by legislative mandates which assign responsibilities, by the structure of the organization and by the plans of the policy system as well as those of the private sector. At the same time, in the course of activity selection and programme development by the governmental forest authority, it may be found appropriate to suggest changes in management objectives, legislation, structure of the organization and policy plans.

The management process then proceeds to the third step of determining the resources needed for operation of the organization (time, funds, personnel, equipment and supplies). Subsequently, as the next and fourth stage of management, the selected activities must be scheduled into a logical and coherent work programme. The fifth element is the application of the resources in the execution of the programme which involves supervision, coordination and control leading to the generation of results or outputs and their application which contribute to the overall results of policy implementation.

The first four stages in the management process form the subprocess of planning. Utilizing the plan thus prepared, the process moves to execution in which activities are carried out according to the established schedule and employing the assigned resources. During programme execution it is essential to compare continuously results or progress in relation to plans. Using this monitoring procedure it is possible at an early moment to detect potential or existing trouble and take action to resolve the problem before serious consequences occur. Upon completion of a plan or programme, an evaluation can be carried out in which all the elements of the management process and the application of results can be assessed to see what modifications or improvements should be incorporated for the future. It is well to remember that an evaluation of whatever element or elements can also be carried out during the management process.

An important characteristic of the concept of management as a system is the cyclical pattern or "feedback" which permits modification to the preceding elements. This is indicated in the diagram by the direction of the arrows. The cyclical pattern indicates that during planning and programme execution, it is possible to modify objectives, activities, resources and scheduling if it proves necessary, always taking into account that a change in one element may affect all the other elements in the management process. This cyclical pattern is dynamic and continuous, repeating itself as many times as necessary for the management of the organization.

The management process is dependent upon information which must be available to the various levels of personnel in the organization when needed. The choice of objectives, the preparation of work programmes, the allocation of resources all require a wide variety of information too diverse to specify. The execution and control of work programmes and budgets and the evaluation of results also depend on information provided by inspections and reports. In short, an effective organization should have some form of information system incorporated into its structure to satisfy this fundamental demand.

The management process, as just described, has as its basis the selection of objectives which establish the mission of the organization. All subsequent decisions and actions are taken with the intent of achieving these objectives. This common sense requirement has been formalized in procedures that have been given the names of the planning, programming and budgeting system (PPBS) and management by objectives.

PPBS was designed principally as a budgeting method to allocate funds to alternative, competing programmes. As defined in the United Nations report (1970) the method requires a clear definition of objectives, identification of the alternative means of achieving them, evaluation of the alternatives in relation to objectives, a projection of the future stream of costs and benefits and a decision on the optimal or most satisfactory alternative. For a critique of PPBS, see Merewitz and Sosnick (1971).

Management by objectives is a method, practically identical to the process shown in Fig. 5, which is characterized by first defining objectives and then all future decisions are conditioned by the success of achieving them. Programmes of activities, organizational structure and funding can be varied; always with the intent of achieving the organization's objectives. The document, U.N., 1981, states that management by objectives involves the identification of aims and objectives, the definition of managerial responsibilities in terms of expected results, (the targets) and the measurement of performance against the stated aims and objectives. The essential features of management by objectives are:

- It makes objectives explicit and recognizes the multiple objective nature of the management problem
- Identifies conflicting objectives
- Provides for feedback and measures of accomplishment
- Fosters acceptance of responsibility for results and provides a means for evaluating managers.

The successful use of management by objectives requires that targets set should be measurable, they must be accepted by all concerned and they must contribute to the achievement of higher management and policy objectives. A comprehensive discussion of management by objectives is given in Banco Interamericano de Desarrollo (Interamerican Development Bank) (1979).

#### 4. The Role of a Public Forestry Administration in Formulating and Revising Forest Policy

Although a given forest policy is the product of the various forces and influences described in Chapter I, Section 4, a public forestry administration must act as a major contributor to defining or revising a government's forest policy, since it is the public organization most closely associated with the sector. In the course of its daily activities, whether aware or not, it is constantly probing, testing and evaluating the appropriateness and content of forest policy and trying to adjust it to the current situation and needs.

A public forestry administration in its operations, previously described as the management process, carries out activities to achieve its management objectives. The results of its work programmes not only indicate how well it is achieving these specific objectives but, at the same time, provide evidence of how well higher policy objectives are being attained. Furthermore, they provide information to decide if these higher objectives are still valid or should be modified.

As a simple example, suppose that a given policy objective is the protection of private forest lands by the joint actions of the governmental forest authority and the the private owners. A cooperative fire control programme was concluded with the private owners but during the course of the ensuing fire season it became clear that these owners were not or could not carry out their obligations and fire losses were excessive. Obviously, the policy was not being achieved and some modifications were required. These could vary from changing the policy objective itself to modifying the details of the cooperative work programme and its financing. Similar situations will arise continually in regard to other components of a forest policy.

The selection or modification of specific policy objectives at lower levels in the objective structure, particularly management objectives together with their relevant activities, may be taken directly by the public forestry administration without seeking approval at higher governmental levels, as long as they are consistent, and in harmony, with broader forest policy.

The formulation or revision of the wider aspects of national forest policy usually require decisions and approval at higher governmental levels although the public forestry administration may take the initiative in making recommendations. Policy decisions of broader scope will inevitably bring into the debate the other actors discussed in Chapter I, Section 4. In some cases, the initiative for policy changes may be taken by these other participants in the process and the public forestry administration may find itself obliged to react or even defend itself if the changes sought are counter to current policy. Changes in an existing policy, sought by external participants, may be favoured by the public forestry administration or may be resisted. The need for modifying a current policy may not have been recognized within the public forestry administration until suggested by an outside party. Upon analysis and reflection the public forestry administration may then accept the proposal. (For example, the need to take into account recreation and wildlife requirements in logging plans.) On the other hand, efforts to change forest policy may be considered detrimental and opposed; for example, the proposal to sell all government-owned productive forest land to the private sector.

In the more highly developed and experienced public forestry administrations the analysis, review and making of recommendations on policy may be formally carried out on a continuing basis by designated personnel or units. In smaller, less developed organizations, on the other hand, actions of this type tend to be taken on an ad hoc basis, usually as a reaction to a crisis, conflict, complaint or pressure. But in either case, a public forestry administration is inevitably drawn into the policy making process, often occupying the most visible position.

If at all possible, the most desirable way for a public forestry administration to make its contribution to forest policy definition is to establish an identified unit in the governmental forest authority charged with policy analysis and review. The staff of such a unit should carry out a continual review of the national forestry situation, prepare sector and background studies, collect and compile pertinent information and relevant data, propose positions regarding controversial issues for decisions at higher levels and suggest modifications, adjustments and alterations to existing policy. (Chapter II, Section 3 suggests the type of information which such a unit could compile.) The unit should also be prepared to make studies of, and recommendations on, proposed legislation being debated or considered by governmental authorities or legislative bodies.

ANNEX I

EXAMPLE OF THE STRUCTURING OF OBJECTIVES OF A FOREST POLICY

As an example of the process of objective structuring, this annex presents a hypothetical forest policy for a developing country. It has been assumed that no previous, formal, declared statement of policy exists. The contents of this example are simply illustrative and are not presented as recommendations to be followed in the preparation of a policy for a government. Undoubtedly, there would be many differences in the objective structure for a specific country. In terms of the diagram shown in Fig. 2 of the text, the objectives described in the example below represent the goal at the first level, followed by 12 immediate objectives at the second level, each of which are then subdivided into series of more explicit third-level objectives. In addition, the description of objectives at all levels has been kept brief. In the preparation of an actual policy objective structure, it would be necessary to amplify each of the objective descriptions and to subdivide further the third-level objectives into more detailed targets which would then guide the formulation of legislation and the preparation and execution of work programmes.

EXAMPLE

The National Forest Policy For

The Goal or Long-Range Objective

The government's long-range objective is the accelerated growth and development of the nation's forestry sector in harmony with regional and national development plans and programmes. The achievement of this goal requires an improvement in the management, protection, rational use, increase and diversification of the country's forest resources, including wildlands, national parks and wild fauna, observing the principles of multiple use and the maintenance of an ecological balance with a minimum pollution of the environment, all for the benefit of the people. To achieve these ends, it is essential that there be a sustained yield of an adequate area of existing forests: the afforestation and reforestation of all those lands best suited for forest production, environmental protection and recreation; stimulation of forest utilization to satisfy national requirements and for export; the management of wildlands of scientific, recreational, scenic and cultural values; the management and rational utilization of wild fauna; education of the public regarding the wise use of natural resources and the training of personnel in their management; the execution of appropriate research programmes; the dissemination of information and the provision of technical assistance to the public. At all times these objectives will take into consideration human needs and sociological relationships with special emphasis on rural development and active participation of the population in forestry activities.

This long-range objective is more explicitly defined according to the following categories of immediate objectives:

- I Role of the forestry sector in the country's economy and social welfare
- II Relation between state and private forestry
- III The establishment, size and maintenance of a State Forest Patrimony
- IV Management of the State Forest Patrimony
- V Management of private forests and forest lands
- VI Forest industries and marketing
- VII National parks, equivalent areas and wildlands
- VIII Conservation of wild flora and fauna
- IX Education and training
- X Research
- XI Extension and technical assistance
- XII Environmental protection

#### Immediate Objective I

(Role of forestry in the country's economy and social system)

The objective is an increase in the actual or potential contribution of the forestry sector to the nation's economy and social welfare by the following: 1/

1. The stimulation of forestry activities which will generate employment, increase income and raise the standard of living of the population, especially in rural communities and areas utilizing financial incentives and assistance in the establishment and operation of rural institutions and organizations.
2. An improvement in communications between the forestry sector, other sectors, financial institutions and the public in general.

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1/ The statement of this immediate objective and those presented subsequently are phrased so that they describe conditions to be worked towards or maintained. They do not indicate the activities required to achieve them.

3. The encouragement of agro-forestry activities to increase and diversify both forest and agricultural production, increase rural income and control land degradation and environmental pollution utilizing programmes of technical assistance and the provision of marketing services and credit.
4. The improvement of electrical, sanitary, water and educational public services to rural communities dependent upon forest and wildland activities to raise the standard of living of the population and reduce migration to urban areas.
5. Stimulation of public participation, especially the rural population, in taking decisions on forestry and related activities which affect their welfare.
6. Encouragement of and assistance to individuals and communities, especially in rural areas, to carry out forestry programmes on private and communal lands for the production of forest-based goods and services to meet local needs.
7. Stimulation of the production and use of fuels from forest resources to contribute towards meeting the nation's energy requirements.
8. Encouragement of forestry related activities which will contribute to the food supply, especially for rural populations, utilizing meat from wild game and minor forest products.

Immediate Objective II  
(Relation between state and private forestry)

The objective is a joint and harmonious effort at forestry development by the public and private sectors in those functions best suited to each. More specifically:

1. The governmental function in relation to private forestry development is coordination, stimulation and control. The responsibility for these activities is assigned to a State Forest Authority located in a Ministry of Agriculture. In addition, this organization is responsible for management of the State Forest Patrimony and the National Park System.
2. The role of the private sector is predominantly production of timber and other forest products. However, the State has an executing role in those cases where there is no incentive for productive activities by the private sector but which are of benefit to the national welfare.
3. The state recognizes the right of private ownership of forest land in accordance with national policy and laws regarding ownership of land. To the maximum consistent with national welfare, maintenance of an ecological equilibrium and prevention of environmental pollution, productive forest land should be in private ownership.
4. The protection of private lands against destructive agencies is primarily a responsibility of their owners although the state may take actions to stimulate private protection programmes and may participate in their execution when considered necessary.

Immediate Objective III

(The establishment, size and maintenance of a State Forest Patrimony)

The objective is the maintenance under governmental ownership, in the form of a State Forest Patrimony, of those forest and wildlands which are not considered appropriate for private ownership or for reasons of national interest and security should be under governmental control. The realization of this objective requires:

1. Definition of those categories of forests or lands which form the State Forest Patrimony.
2. The physical indentification and delimitation on the ground of those lands constituting the State Forest Patrimony.
3. The establishment of rules and regulations for the acquisition of lands, modification of limits and the alienation of elements of the State Forest Patrimony.
4. As a maximum, the State Forest Patrimony should not constitute more than 50% of the nation's forest and wildlands and should strive to include all forest types and ecosystems and a balanced geographic distribution.

Immediate Objective IV

(Management of the State Forest Patrimony)

The objective is the management of the forests, forest and wildlands constituting the State Forest Patrimony according to the following:

1. The application of the principles of multiple use and sustained yield for the production of goods and services from these lands. The highest priority will be given to the objectives of environmental and watershed protection, recreation, education and research. Timber production activities will be carried out to the extent they do not interfere or jeopardize the achievement of the previously mentioned objectives.
2. The exploitation of water and mineral resources occurring on the State Forest Patrimony will be severely limited and only allowed if they do not cause alteration or damage to the natural environment or ecosystems.
3. The application of silvicultural methods for the management of the State Forest Patrimony which will improve quantitatively and qualitatively the forest and vegetative communities and at the same time have minimum negative aesthetic and environmental effects.
4. The authorization and control of forest exploitation activities or land uses in the State Forest Patrimony according to approved management plans utilizing methods which will cause a minimum or acceptable negative effect upon the environment. All exploitation activities will require an environmental impact study prior to authorization. These exploitative activities may be executed by the State Forest Authority or by private operators under systems of sales, concessions or permits.

5. The protection of the State Forest Patrimony against destructive or disruptive agents such as fire, insects, diseases, illegal occupation or settlement, trespass or unauthorized exploitation.
6. The production by the State Forest Authority of planting stock for afforestation and reforestation of government lands and for sale to the private sector.

Immediate Objective V  
(Management of private forests and forest lands)

The objective is the correct management of privately-owned forests and forest lands by their owners for production and protection, taking into account the national welfare and ecological requirements. The achievement of this objective requires:

1. The identification and delimitation of those lands in private ownership which are best suited to forestry. The classification will require governmental approval.
2. The management of private forests and forest lands according to minimum requirements established by the State Forest Authority.
3. The exploitation of privately-owned forests on those lands considered best suited for forestry, according to management plans approved and controlled by the State Forest Authority in order to assure natural or artificial regeneration of desirable species.
4. The use of financial incentives by the State to encourage forest practices which will improve the quality, quantity and growth of forest and forest land resources in private ownership.
5. The forestation and reforestation by their owners, of private lands classified as best suited for forestry.
6. The afforestation and reforestation by the State Forest Authority of those privately-owned lands considered of national interest but where the private sector cannot undertake the required action.
7. The production by the private sector of planting stock for afforestation and reforestation of desired species on privately-owned land.
8. The protection of privately-owned forests and forest lands by their owners against destructive or disruptive agents such as fire, insects, diseases, illegal occupation and trespass according to governmental regulations.

Immediate Objective VI  
(Forest industries and marketing)

The objective is the development of forest industries and the commercialization of their products to satisfy national demand and increase exports by:

1. Encouraging the establishment, expansion, improvement of installations, productive processes and quality of products of private forest industries with satisfactory economic and financial rates of return. The state will not operate forest industries but, in special cases, may participate in private industries in a minority and transitory role.
2. The compilation and dissemination to the public of statistics on forest industries, e.g., number, type and sizes; productive capacities and actual production; value of products amounts exported and imported with information on origins and destinations, etc.
3. Carrying out indicative type planning with recommendations regarding the establishment of new and the expansion and improvement of existing forest industries for action by the private sector.
4. The sale of raw material from the State Forest Patrimony to private industry, with the condition that this is done in accordance with the management objectives established for these lands.
5. The establishment of a uniform and obligatory system of measurement, classification and grading of forest products for use in national and international commerce.
6. Freedom to export forest products in any stage of elaboration from logs to manufactured goods.
7. The control of the transportation of forest products to provide information on the import, export and domestic movement of quantities and types of forest products, to collect taxes or tolls and to impose sanitary measures.
8. The provision of technical assistance to private forest industry to improve its installations and manufacturing processes.

Immediate Objective VII  
(National parks, equivalent areas and wildlands)

The objective is the establishment of a National Park System consisting of national parks, equivalent areas and wildlands to provide facilities for outdoor recreation, tourism, natural resource education and investigation, the conservation of genetic resources and protection of the environment. The realization of the objective requires:

1. Definition of those lands which form the National Park System with explanations of the objectives of management for each category.

2. The physical identification and delimitation on the ground of those lands constituting the National Park System. The units should represent all the natural ecosystems in the country and present a balanced geographic distribution.
3. The establishment of rules and regulations for the acquisition of lands, modification of limits and the alienation of elements of the National Park System.
4. The determination and application of management and use regulations for the lands of the National Park System so that they are maintained as much as possible in their natural, undisturbed state.
5. The protection of the National Park System against exploitation of its natural resources, illegal occupation and appropriate control of such destructive agents as fire, insects and diseases.
6. To the extent possible, the establishment and maintenance of visitor facilities, such as lodging restaurants, shops, etc. outside the boundaries of the units of the system. Only the physical facilities considered absolutely essential will be permitted within the limits of the areas.

**Immediate Objective VIII**  
(Conservation of wild flora and fauna)

The objective is the protection, management and utilization of those species of wild flora and fauna which occur naturally in state and private forest, forest and wildlands, and in national parks and equivalent areas and have economic, scientific, aesthetic or cultural value or have a site protection function through:

1. The preparation of inventories, censuses and maps indicating quantities, composition, area, location, condition, actual and potential use of the various species or associations of wild flora and fauna.
2. The authorization and control of exploitation of wild flora and fauna on public and private lands according to approved norms, regulations and management plans.
3. The protection or prohibition of exploitation of wild plant and animal species in danger of extinction and considered of value for aesthetic, cultural, scientific or commercial value.
4. Control of national and international commerce in protected species of wild flora and fauna and their products.
5. Control of the introduction of exotic species of wild flora and fauna which may have detrimental effects on the environment or be injurious to native wild or domesticated flora and fauna.
6. Control of the introduction of plant or animal diseases or pests which may be injurious to native wild flora and fauna or have a detrimental effect on the environment.

7. Control of native or previously introduced plant or animal diseases or pests which are injurious to native wild flora or fauna or have a detrimental effect on the environment.
8. Control of native or previously introduced species of wild fauna which have a detrimental effect on the environment or are injurious to native wild flora and fauna.
9. The management, in selected areas having appropriate conditions, of those species of wild fauna of value for commercial, scientific, or aesthetic reasons.

Immediate Objective IX  
(Education and training)

The objective is the establishment and functioning of facilities for the education and training of personnel to serve at different levels in the Public Forestry Administration and in the private sector for the management, development and use of the natural resources occurring in forests, forest and wildlands, national parks and equivalent areas by means of:

1. The education of professional foresters, land and environmental managers and related professional personnel concerned with management, protection, administration, utilization and research.
2. The training of technical personnel (e.g., ranger level) in forestry, land and environmental management and related activities who will collaborate and assist professional level personnel in the exercise of their functions.
3. The training of forest guards, foremen and workers who participate directly in the physical execution of activities to increase their productivity, reduce accidents and raise their income and standard of living.
4. The establishment, funding and operation by the state of educational or training facilities for each of the levels mentioned where justified. Additional facilities may be established by the private sector.
5. The establishment and operation of an advisory group on forestry education and training to make recommendations on manpower needs, institutional adequacy and curricula content.
6. The establishment and operation of in-service and continuing education programmes for staff of the State Forest Authority and other governmental agencies concerned with forestry.

Immediate Objective X  
(Research)

The objective is the execution of research by public and private organizations to provide information and develop technology which will permit better management and utilization of the natural resources occurring in forests, forest and wildlands, national parks and equivalent areas through achievement of the following:

1. The establishment of a research advisory board drawn from members of the forestry sector and including representatives of the private sector concerned with forest-related activities to cooperate with the State Forest Authority in the formulation of a national plan for required forest and related research indicating priorities for the short, medium and long term.
2. The establishment and operation of a research organization within the State Forest Authority.
3. The execution of research by the State Forest Authority with priority given to research required for the management of the State Forest Patrimony and the National Park System; investigations which provide information of general usefulness to the private sector are of secondary priority.
4. The encouragement and stimulation of research activities by the private sector through financial incentives.

Immediate Objective XI  
(Extension and technical assistance)

The objective is the dissemination of general, technical and economic information to create a better appreciation by the public of the value of renewable natural resources and to improve the management, protection and rational use of the country's forests, forest and wildlands, national parks and equivalent areas. This involves:

1. Publication and explanation to the public of the objectives and legislation relative to the country's forest policy.
2. Dissemination of general information stimulating the creation of public and political awareness of the importance of forests to human welfare and thus the necessity of conserving the country's renewable natural resources and protection of the environment.
3. Presentation to interested parties in the public and private sectors of the results of research and other technical information for better management and utilization of renewable natural resources in forests, forest and wildlands, national parks and equivalent areas.
4. Establishment and operation of an extension organization in the State Forest Authority or other appropriate organization to provide technical assistance to the private sector.

Immediate Objective XII  
(Environmental protection)

The objective is the execution and control of all forestry or related activities to minimize their negative impacts on the environment or damage to forest and wildland resources (soil, air, water, wild flora and fauna). At the same time, the control and regulation of all other activities which may cause damage or degradation to forest and wildlands and the natural resources occurring on them. The realization of the objective of environmental protection requires:

1. The preparation of an environmental impact study for any proposed activity on state or private forest and wildlands. The responsibility for its preparation and cost will be borne by the owner of the land.
2. The review of all impact studies by appropriate units of the State Forest Authority, which will have the power to refuse or grant permission for the activity.
3. The detection, by the State Forest Authority, of environmental pollution or damage to forest and wildland resources, both state and privately-owned, caused by non-forestry activities.
4. The control by the appropriate governmental agencies of the causes of environmental pollution or damage to forest and wildland resources, both state and privately-owned.
5. The restoration and rehabilitation of eroded or degraded lands and control of the process of desertification on both state and private lands.

ANNEX II

ASSIGNMENT OF PRIORITY TO OBJECTIVES

A fact of life in planning policy objectives or the more specific management objectives of an organization, is that resources are always insufficient to achieve all the objectives which are proposed or considered desirable. The principal resource in limited supply is money which is translated into insufficient time, personnel, equipment and supplies to allow the execution of actions needed to attain the objectives. When the resources available are insufficient to attain all proposed objectives, it becomes necessary to make choices, eliminating or modifying some objectives. In this planning situation, some of the proposed objectives will be considered of greater importance than others. In the event of resource limitations, logically the lower ranking or less important objectives would be considered first for modification or elimination.

The assignment of priorities to objectives is a difficult and often controversial task. Nevertheless, it is essential in policy formulation and in the administration of forestry administration.

Ideally, the assignment of priorities should be influenced by the importance and magnitude of the benefits one expects to obtain by realizing the objective and the ramifications and linkages which the objective has to other objectives in the forest or related sectors. Unfortunately, the quantifiable estimation of the benefits of achieving many policy or organizational objectives is not feasible or may be insufficient to permit a sound decision. Lacking these measures of benefits, the assignment of priorities must often be subjective.

One possible system of ranking would be to assign all objectives to one of the following three priority classes: I, Maximum; II, Medium; III, Low. An example of the kind of critieria which one might use is as follows:

- I. Maximum priority. Essential to the policy or programme for the period and if not specified and achieved will result in a serious deficiency. The objective :
  - i) Should aim at removing or reducing a major forestry, forest industry or forestry-related social development obstacle and, at the same time, be consistent with acceptable ecological goals or restrictions.
  - ii) Should make a significant contribution to an improvement of the economy.
  - iii) Should be within the possibilities of achievement with the resources available.
  - iv) Should require urgent or immediate attention.
- II. Medium priority. Desirable for achievement in the planning period but, if not achieved or only partially accomplished, no serious difficulty would result, providing it is achieved in the following planning period. The objective:

- i) Should be considered important to forestry, forest industry and forestry-related social development but not necessarily requiring immediate attention.
- ii) May also be included in other sector policies or pursued by other governmental units.
- iii) Should be within the possibilities of achievement but may require additional resources whose availability is uncertain.

III. Low priority. Could be postponed to the next or future planning periods without serious adverse effects. The objective:

- i) May be considered important only for restricted components of the forest sector or limited geographic areas, not necessarily designated for major attention.
- ii) May also be worked towards by other agencies with major responsibilities in this area.
- iii) Would require major increase of resources to achieve, whose availability is doubtful.

Once an approach of this type has been adopted, the exercise should be carried out for each planning period. Since the objectives of a continuing policy or organization usually do not undergo radical changes from one period to another, the objective structure would undoubtedly carry forward with small changes accumulating from period to period (unless some important issue has occurred which requires a major revision of objectives). For each planning period, one would expect only minor changes, if any, at the first and second levels of the objective structure with greater probability of modification in the more detailed working level objectives. Over several planning periods the changes would accumulate illustrating the evolutionary nature of policy formulation.

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