CHAPTER 2

FOREST MANAGEMENT IN INDIA
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FOREST ORGANISATION

Forests occupy about 19.39 percent of the total geographical area of the country. These forests do not occur in a compact block but are usually scattered all over the country almost in all the States. The application of various silvicultural practices and management in these forests need a proper division of these forests into workable units. This will help in describing, locating and working the area. For carrying out various silvicultural and management practices in forests, a definite organisation with definite set up is required. The forest organisation can therefore be discussed from the following point of view: -

(i) Territorial

(ii) Administrative

(iii) Silvicultural

I. Territorial Division of the Forests

The forests from the point of view of territory are classified into: -

(i) Blocks

(ii) Compartment

(iii) Sub-compartment

(i) Block: -

A block is a main territorial division of the forest, generally bounded by natural features, bearing a local proper name (i). Forests blocks have clear-cut boundaries all around with numbered pillars along it. The formation of a forest
block takes place from the point of view of separation of the forest area from the adjoining land of different land use, ownership etc. The blocks, in fact are subdivisions of large forest area and identified with the help of local name and usually no great significant from the point of view of the management of the forests. It is a common practice to adopt the name of an important village in naming a forest block.

The forest blocks are usually shown in the map sheets. The area of forest block may vary. It may be sometimes hundred hectare or less but usually it is thousands of hectare.

(ii) Compartments: -

A block is further divided into compartments, which are defined as territorial units of a forest permanently defined for the purpose of administration, description, location and record. A compartment is a permanent working plan unit and is usually district on the ground as well as on the map. A compartment is kept, as far as possible, homogeneous throughout its extent with regards to the composition of growing stock, soil and aspect. A compartment is separated with other compartments with the help of artificial cut lines, paths, streams, ridges etc. Compartments are identified by numbers in Arabic numerals, 1, 2, 3, 4 and so on and are indicated in the map sheets. Thus, a compartment in Rampur block would be referred to as Rampur 1, and Rampur 2 and so on.

The area of a compartment depends mainly on the intensity of management. In forest areas worked intensively, the area of a compartment is usually small and sometimes it may be around 10-20 hectares. However in forests managed extensively, the area of a compartment may go up to 1000 hectares or even more. The other factors such as topographic and site variations may also affect the area of the compartment. The average area of a compartment in Indian forests usually ranges between 50-100 hectares. In many areas the area is about 75 to 100 hectares. Smaller compartments of about 10-20 hectares have been formed in some Forest Divisions e.g. Nilambur (Kerala)
where intensive management is practiced. In European countries a compartment is usually of 10 hectares. In Switzerland, common size of a compartment is 7-8 hectare. In England and France this is usually 10 hectare.

During the preparation of a working plan a compartment is inspected and if necessary it is further sub-divided into sub-compartments.

(iii) Sub-Compartment: -

A sub compartment is defined as the sub-division of a compartment, generally of a temporary nature, differentiated for special description and treatment, designated by small letters a, b, c, etc. (1). Sub-compartment is usually identified as a unit of treatment. The compartment is divided into sub compartments mainly on the basis of the nature of growing stock. Site and topographic factors, which affect the growing stock, is usually accounted. In areas of intensive management a sub compartment forms the unit of treatment.

The area of a sub-compartment is much smaller than a compartment. The number of sub-compartments in a compartment may be two, three, four or more. The area usually varies from 5 to 50 hectares or more depending upon the intensity of the management. Sub-compartments smaller than 5.0 hectares are not very common. In France it is considered undesirable to have more than three sub-compartments in a compartment and the minimum size should be approximately one fourth of the compartment (2). Sub-compartments being temporary in nature are sometimes not demarcated on the ground but are marked on the map sheets and their area is available on these sheets. They are unit of silvicultural and utilization treatments. A sub-compartment would be referred to as Rampur la, and Rampur lb etc.

Block and compartment are identified on the ground primarily for administrative purposes. Application of a set of silviculture practices requires formation of sub-compartments. In forestry practices of the most of the countries
a subcompartment is usually synonymous to the stand, particularly in areas of intensive management.

Administrative Organisation:

Before 1976 forests were primarily controlled by State Governments because they were included in the 'State list'. But now forests have been included in the 'concurrent list' and therefore central Government has also some say in the management and control of the forests in the country though direct and active control, supervision and management remains with the State Governments.

The forest occurring in a particular State is divided into various administrative units for maintaining effective control and supervision of the forests. The most common system adopted in various states is indicated below:

<table>
<thead>
<tr>
<th>Administrative Unit</th>
<th>Incharge Officer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Forest Deptt. Of the State</td>
<td>Principal Chief Conservator of the Forests and Chief Conservator of Forests.</td>
</tr>
<tr>
<td>2. Circle</td>
<td>Conservator of Forests.</td>
</tr>
<tr>
<td>3. Forest Divisions</td>
<td>Dy. Conservator of Forests or Divisional Forest Officer.</td>
</tr>
<tr>
<td>4. Forest Sub-Divisions</td>
<td>Sub-Divisional Forest Officer or Assistant Conservator of Forests.</td>
</tr>
<tr>
<td>5. Range</td>
<td>Range Officer.</td>
</tr>
<tr>
<td>6. Sub-range or Block</td>
<td>Sub-Range Officer or Block Officer.</td>
</tr>
<tr>
<td>7. Beat</td>
<td>Beat guard</td>
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</tbody>
</table>

Overall incharge of the forests in a State is a Minister usually the 'Forest Minister'. In State where forests are not large, some other minister may look after the affairs of the forests of the state. Forests are managed under a department usually called Forest Department of the State. Himachal Govt. has recently
renamed the forest department as the 'department of forest farming and environmental conservation.

The administrative head of the forest department is the Principal Chief Conservator of Forests (P.C.C.F.). In Madhya Pradesh the head of the department is designated as Conservator in Chief of the Forests. Usually there is one Principal Chief Conservator of Forests in every State. More recently with the increase in the workload more than one Chief Conservator of Forests have been appointed. The division of work between more than one Chief Conservators of Forests is generally on the basis of the area i.e. State is divided into as number of zones or regions as the number of Chief Conservator of Forests. In Madhya Pradesh there are two Chief Conservator of Forests (East) and Chief Conservator of Forest (West). The whole state is divided into two regions, each under a Chief Conservator of Forests. Similarly in Himachal Pradesh there are two Chief Conservator of Forest North or C.C.F. (N) and other Chief Conservator of Forests, South or C.C.F. (S).

A Chief Conservator of Forests (C.C.F.) is assisted by one or more than one Additional Chief Conservator of Forests. In some states there are Deputy Chief Conservator of Forests (Dy. C.C.F.) to assist the Chief Conservator of Forests.

The charge of Chief Conservator of Forests is divided into circles. The officer in charge of the Circle is the Conservator of Forest. The number of Circles in the State depends upon the area of the forests in the State. A big State like Madhya Pradesh may have 15 territorial circles while smaller States may have only one. The mean area of a circle is about 10,000 Sq. Kms. A circle is further divided into Divisions. The mean area of a division is about 1600 Sq. km. The officer in charge of a forest Division is called Divisional Forest Officer. An officer of the rank of Deputy Conservator of Forests is generally appointed Divisional Forest Officer. In some States a senior Assistant Conservator of Forests also
holds the charge of Forest Division. In some States, there are District Forest Officers in place of Divisional Forest Officer.

The charge of a Divisional Forest Officer generally coincides with the revenue district of the state. But if a district is rich in forest, there may be more than one forest Division in the district. For example, Bastar district of Madhya Pradesh and Chanda district in Maharashtra have more than four Forest Divisions in each case. Some Forest Divisions may be so large in geographical area that two or more than two revenue districts may be included. Forest Division is important unit in the Forest Department.

In many States a Forest Division is divided into two or more sub-divisions. The officer who is incharge of the sub-division is called Sub-Divisional Forest Officer. The work of Sub-Divisional Forest Officer is to assist Divisional Forest Officer. In many States, there are no sub-divisions. Assistant Conservator of Forests (A.C.F.) attached to the Forest Divisions assist the Divisional Forest Officer in his work. In West Bengal, there are Additional Divisional Forest Officers (A.D.F.O.).

The Forest Division is divided into number of subordinate units called 'ranges'. The officer who is incharge of the range is called Range Forest Officer or Ranger (R.F.O.). The area of the range may vary from 50 to 200 Sq. Km. and average is about 120 Sq. Kms. Each range is further divided into sub-ranges or blocks. The officer incharge of this unit is called sub-Range Officer or Block Officer. The officer who is the incharge of the range is of the Ranger Cadre. The rangers are professionally trained persons. Range is very important unit in the administration and management of the forests. It is the basis of all the silvicultural and management operations. The incharge of sub-range or Block is called Sub-Range Officer or Block Officer. They are usually of the cadre of Deputy Ranger or Senior Forester. A block is further divided into 'beats'. This is the lowest administrative unit in the Forest Department. The incharge of this unit is a 'Forester' or Forest Guard. In some states a Forester is 'beat officer' and there
are one or two Forest Guards to assist him. But in many States a Forest Guard is usually the ‘beat officer’. A beat ordinarily comprises of about 25 Sq. km. of forest area. It ranges from 10 Sq. km. or more. The all India average is about 35 Sq. km.

In many States, Forest Corporations have started functioning. The forest Minister of the State is usually the Chairman of such corporations. The administrative head of Forest Corporations is usually called Managing Director. There is generally a board of directors of nominated members who frame the guidelines for the working of the Forest Corporations. There are General Managers, Deputy Managers, and Assistant Managers for major operations. There is more variation in this organisation from state to state.

In Gujarat Secretary, Forest is the highest authority in forest department. There is one principal Chief Conservator of Forests (PCCF). There are Chief Conservator of Forests (CCFS) to assist the PCCF Conservator of Forest are responsible for the forests falling in a circle. Deputy Conservator of Forests (DCF) is responsible for the forests of a division or district. Assistant Conservator of Forests assists in the management of division to DCF. Range Forest Officer (RFO) looks after a range. There are foresters and beat guards to assist the RFOs to manage the forests of the range.

At the Central Government level, all Government owned forests in the Union Territories are under the control of the Government of India and administered on their behalf by the Inspector General of Forests of India with head quarters at Delhi. The Inspector General of Forests is assisted by number of Deputy Inspector Generals of Forests. With the inclusion of Forests in the “Concurrent list” constitution India, there be some change in the set up of Forest Department in the Ministry of Agriculture and Irrigation.

Central Board of Forestry is responsible for formulating National Policy regarding forests. This is a high power Committee. All the Forest Ministers of the State Governments and Chief Conservators of Forests and its members. In order
to carry out research in the various field of forestry, there is a Forest Research Institute at Dehradun. This is one of the biggest Institutes in Asia. There are a number of field stations located in various States.

WORKING PLAN

Technically, a forest working plan has been defined as a written scheme of management aiming at continuity of policy and action, and controlling the treatment of a forest. The treatment depends on the objective to be achieved. This may be economical, protective, bio-aesthetic or a judicious combination of two or more of these. As forests take long to mature, it is essential to have a management plan to ensure continuity of action. There are certain necessary preliminaries to the preparation of a working plan. The owner must lay down a policy which he desires to follow and which is realisable. The policy must be supported by a forest law. He must also take adequate steps to see that it shall be enforced. The forest be clearly demarcated, surveyed and mapped. A record of rights should also be available, as it may become necessary to curtail or extinguish some portions to ensure proper development of the forest. When a working plan for a forest is being prepared for the first time, it is necessary to make a reconnaissance to ascertain the general nature of the terrain, the climate and the soil and their effect on the forests. An accurate assessment of the requirements of the species is also made by a rapid survey of the various ecological factors operating in the locality. In India such information is generally already available except for certain remote forests for which there are no large-scale maps and which have not yet been worked. A map must be prepared by a rapid survey before commencing other work. In the reconnaissance report, the Working Plan Officer deals with the history of the forest in the immediate past and its effects, outline of the demand, object of management, silvicultural system considered most suitable for different forests, method of calculating the yield, development of communications, etc. This report is submitted to the proprietor or in the case of Government forest to the next superior officer, generally the Conservator of Working Plans. It is examined at a conference of persons
acquainted with the forest and a set of instructions is drawn up for the guidance of the Working Plan Officer on various points raised in the report, on the basis of which he commences his work. When a forest is being brought under a working plan for the first time, it is divided into convenient administrative units called compartments. A compartment is a territorial unit of a forest permanently defined for purposes of administration, description and record. Compartments are generally designated by Arabic numerals. These are generally 100 to 400 hectares in extent depending on the intensity of management. As far as possible they have natural or artificial but permanently maintained boundaries and are numbered serially for the entire forest, care being taken that the successive compartments are contiguous, as far as possible. Thereafter the forests are inspected in detail and a history written up, compartment-wise, giving boundary, physiography, soil, description of the growing stock and regeneration, past history and a rough indication of the future working. Simultaneously, a decision is taken as to which compartments need to be enumerated to find out the standing growing stock.

On the basis of information thus collected Part I of the Working Plan giving Facts on which proposals are based is written, under the heads: name and situation, local conditions, general history of the forests, ecological factors, economic considerations, and statistics of growth and yield. Part II of the working plan gives prescriptions for future management, namely, general objects of management, division of forest into Working Circles and Period of the Plan.

**Silvicultural Division of the Forest**

The forest from the point of view of silvicultural management are classified into the following classes:

1. **Working Circle** – Working circle is defined as a forest area (forming the whole or part of a working plan area) organized with a particular object, and worked under one silvicultural system and one set of working plan prescriptions. In certain circumstances working circles may overlap (3).
Forest area is classified into working circles depending upon the object of the management and the silviculture system to be followed. A working plan area may be divided into one or more working circles. The most commonly adopted working circles in Indian working plans are uniform working circle, plantation working circle, selection working circle, protection working circle, coppice working circle etc. Certain species need special treatment and their area overlap with other working circles, usually kept under overlapping working circle e.g. Bamboo overlapping working circle, khair overlapping working circle, Salai overlapping working circle etc.

The object of the management forms the basis of the division of the forest into working circles. The requirement of large sized timbers may lead to the adoption of uniform working circle. Coppice working circle may be formed in areas where there is a demand of small sized timbers for meeting the requirements of local population and industries. If natural regeneration of existing species is not able to keep pace with the requirements or some other species is to be introduced in the area, plantation-working circle may be formed. The forest occurring in steep slopes, where there is danger of erosion may be managed under protection working circle. It is not necessary to have different working circles for different species. But sometimes site conditions and local requirements may compel to adopt two or more working circles for the management of a single species. For example sal forests may be managed under high forest systems and coppice systems, chir under uniform system and twisted chir working circle and miscellaneous forests under selection working circle and plantation working circle. Overlapping working circles may be necessary if a forest contains a mixture of species one of which is economically important and requires different treatment from the others. Such two treatments should not hamper each other. The species e.g. bamboos, khair, salai, etc. are usually managed under overlapping working circle.
In America a working circle is defined as the primary unit of forest management with well defined boundaries, usually based on topography, large enough to furnish a sustained yield of forest products sufficient to support dependent industries or communities. The working circle in America is used to designate a primary unit of forest management where sustained yield is major consideration. They usually coincide with administrative unit. The term is applied in the national forest where timber management is organised. It is a sustained yield unit.

(ii) **Felling Series** – Felling series is defined as a forest area forming the whole or part of a working circle and delimited so as, (i) to distribute felling and regeneration to suit local conditions and (ii) to maintain or create a normal distribution of age classes. The yield is calculated separately for each felling series which should have an independent representation of age classes (1).

A felling series is usually a part of a working circle, comprising of its own age classes. If a working circle is spread over a large area, more than one felling series are usually recognized. The felling series form the unit of yield calculation and for carrying out various silvicultural operations. But these will follow the same general principle of silviculture system. The demand of local population for meeting their rights and concessions often lead to the formation of smaller felling series if the area of a working circle is small generally no felling series are recognized.

Division of the working circle into felling series often leads to the effective and equal distribution of work in different ranges. The formation of many felling series will lead to the formation of small annual working coupes.

(iii) **Cutting Section** – When felling advances in a definite direction and annual coupes adjoin one another, it is often necessary that fellings may be carried out in cutting section because it tends to check the damage due to exposure to sun, wind and insect damage etc. In clear felling system, a
felling series may be divided into several cutting sections in which annual fellings are carried out in turn. For example, if there are five cutting sections in a felling series, fellings would be carried out every fifth year in any one section, thus there would be a five year growth interval between two contiguous coupes.

(iv) **Periodic Blocks** – A periodic block is defined as the part or parts of forest set aside to be regenerated or otherwise treated during a specified period. The regeneration block is called floating or single when it is the only periodic block allocated at each working plan revision. When all periodic blocks are allotted and retain their territorial identity at working plan revision, they are termed as ‘fixed’ or ‘permanent’ (1).

The periodic blocks are usually recognized in uniform shelterwood system. When the uniform shelterwood system was developed in France, the procedure followed was to divide each felling series into as many self-contained periodic blocks as there were periods in the rotation. These periodic blocks are allotted once for all, each to its respective period. The formation of self contained periodic blocks and their allotment to all the period of rotation has not proved successful due to insect and other injuries. In self contained periodic blocks each area is allotted to a particular periodic block. Thus, if the rotation is 100 years and the regeneration period is 20 years, periodic block I will contain age classes 80-100 years, periodic block II 60-80 years, and so on to periodic block V containing age classes less than 20 years. Each block is regenerated in twenty years in turn from periodic block I to V.

Sometimes it is not practicable to allot different periodic blocks. For example, periodic block I is under regeneration operation, the periodic block V is just regenerated consisting of very young crop and periodic block II, III and IV where the crop is of intermediate stage. Therefore usually these periodic blocks are grouped and called periodic block inter
or intermediate periodic block. Such system is adopted in many forests of sal and conifers.

Single periodic block refers to a system in which only regeneration block is selected after examining each compartment or sub compartment in every revision of the working plan. This system is also called floating periodic block method. In single periodic block method, the period of regeneration is fixed arbitrarily as a fraction of the rotation and regeneration period is fixed 20 years i.e. $1/5^{th}$ of the rotation period, the regeneration periodic blocks are such selected that their area is one-fifth of the total area of the felling series. Sometimes, the forests are first allotted to the regeneration block and then their area is worked out as a fraction of the area of the whole felling series. For example, if the area of the selected regeneration block is one-sixth of the area of the total felling series, the period allotted to the regeneration would be one-sixth of the rotation.

(v) **Coupe** - Coupe is defined as a felling area usually one of an annual series, unless otherwise stated, preferably numbered with Roman numerals e.g. I, II, III and so on. The term is usually applied to the area where fellings or thinning etc. area carried out and are called ‘felling coupe’ or ‘thinning coupe’. The area of the coupe, depends upon number of factors. The area may usually vary between 20-200 hectares but larger and smaller coupes may also be found. Clear felling coupes are usually smaller than selection felling coupes. Similarly thinning coupes are generally larger than felling coupes. The coupes are generally demarcated on the ground in order to make clear the area selected for felling.

(vi) **Section** - This word should not be confused with cutting section already described. When the coupes are larger and sold for a huge sum of money. It becomes difficult for the purchaser to pay all the amount in one time. The coupes are then usually divided into four parts called sections. The purchaser after paying the one-fourth of the sale price is allowed to...
fell and sell the timber in one section. This helps in larger competition and more sale price is likely to be obtained. It is necessary while dividing the coupes, the sections are of approximately equal value.

In short, a working plan, or more approximately a management plan, is a complete document drawn up by a trained forester, after a through assessment of the potentialities of the forests laying down the details of treatment prescribed to realize the wishes of the owner, as far as feasible. Ordinarily, the object is to obtain the maximum yield of produce most in demand at the minimum cost and to keep the forest in a condition that this will be obtained on a sustained and, where possible, progressively increasing basis. As forest trees take years to mature and neglect in tending or faulty exploitation may adversely affect their growth and future yields, a working plan is necessary to ensure continued satisfactory management of a forest.

In India, unfortunately, the entire forest areas of the country are still not covered by working plans. Only 49.7 m ha of the forest area of the country is covered by working plans.

Re-orientation of working plans

A National Seminar of Forest and Environment, held at Bangalore in December, 1981, and attended by almost 150 senior Forest Officers from the Centre and the States, administrators, environmentalists, representatives of Agricultural Universities, non-governmental organisations and others adopted the following Resolution on Forest Working Plans:

"Clear-felling and over-felling of our forests have been taking place on a much larger scale than permissible from the ecological point of view due to a variety of causes and there is need for providing for safeguards against such possibility in the Working Plan. But the Working Plans
hitherto were mainly oriented towards meeting specific demands already in existence with reference to increment, growth statistics and financial returns and no stress was laid on the aspect of orienting the working of the forest as a part of the total eco-system".

The Seminar therefore resolved:

"That the method of preparing Working Plans should be reoriented to ensure preservation of the eco-system and to remedy the imbalances, if any and the existing Working Plan code may be suitably amended for the purpose".

The above, indeed shows a grim situation. All places where over-felling has taken place should be carefully identified at the earliest, and felling and plantation programmes adjusted to ensure preservation of the ecosystem. Needless to emphasize that as explained in detail in the earlier chapters, the production potential, consistent with environmental conservation over extensive areas of our forests is many times more than the present increment / production. This is specially so if as also recommended by the above Seminar, our plantation techniques are "suitably updated to include the use of adequate inputs like fertilizers, intensive soil working by way of mechanized ploughing", and provision is made for proper infrastructure of staff, etc.