

PRACTICAL MANUAL

ON

Forest Management

FSA 203 3(2+1)

For B.Sc. Forestry IV Semester students



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2019

**RANI LAKSHMI BAI CENTRAL AGRICULTURAL
UNIVERSITY, JHANSI**

Forest Management FSA 203 3(2+1):

Practical: Visit to different forest divisions to study the various stand management aspects including thinning, felling and sale of timber. Study forest organizational set up and forest range administration including booking of offences. Visit to forest plantation- Field Exercise for the estimation of actual growing stock volume. Field visit to JFM operational areas. Study the different field exercises for data collection for working plan.

Name of Students

Roll No.

Batch

Session

Semester

Course Name :

Course No. : **Credit**

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CERTIFICATE

This is to certify that Shri./Km.ID No.....has completed the practical of course.....course No. as per the syllabus of B.Sc. (Hons.) Agriculture/ Horticulture/ Forestry semester in the year.....in the respective lab/field of College.

Date:

Course Teacher

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Practical No. 1

Objective: To visit Jhansi forest divisions to study the various stand management aspects: Thinning

- Many treatments are used in stand management to encourage adequate regeneration of harvested stands or to control the type of regeneration
- Thinning reduces mortality (or salvages it before it occurs) by reducing the number of trees per acre. The remaining trees then have more site resources to draw from and typically grow faster and healthier.
- By thinning at regular intervals, one can be assured that stress due to overcrowding is avoided. Thinned trees can then develop stronger root systems and be less prone to windthrow.
- The species composition of a stand can also be influenced by thinning, e.g., depending on which tree species are cut and which are retained.
- Thinning can improve growing conditions, species composition, tree quality, and the economic value of the stand. Importantly, poor thinning choices can reduce quality and economic values (e.g., high grading or always taking the best trees and leaving the worst). However, well planned thinning can provide increases in timber values and economic returns.

Field Exercise:

1. **Name of the visiting forest division:**
2. **Date of visit:**
3. **Locality:**
4. **Area (m²):**
5. **Observations:**

Thinning Methods:.....

Criteria of Thinning:.....

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Factors affecting of Felling:.....

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Goals and Objectives:.....

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Benefits:.....

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Conclusion:.....

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Determination of type of timber sale:.....
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Bidding Procedures and Selection of Buyers:.....
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Permits and Notification:.....
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Monitoring of Sale Products:.....
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Functional classification: National forest policy 1952 suggest functional classification of Indian forest into -

Protection forest.....
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National forest.....
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Village forest.....
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Tree land forest.....
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Objective: To study forest organizational set up: Legal Classification

Broadly classified as –

Reserved forest:.....
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Protected forest:.....
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Village forest:.....
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Practical No. 7

Objective: To study forest organizational set up: Management (silvicultural) Classification

From the point of view of silvicultural management, forests are classified into -

Working Circle:.....
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Felling Series:.....
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Cutting Section:.....
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Practical No. 10

Objective: To visit forest plantation areas

- Plantation of forests can provide most goods and services that are provided by natural forests. These include timber, non timber forest products, protection of clean water and clean air, soil erosion control, biodiversity, esthetics, carbon sequestration, and climate control.
- Nonetheless, as the value of environmental services from natural forests is higher than that from forest plantations, the demand for conservation of natural forests is stronger. It is possible that a division of land, with some land specialized in timber production and other land in providing environmental services, would produce more forest-related goods and services to society.
- Because forest plantations grow much faster than natural forests, forest plantations are seen as an increasingly important source of timber supply. Should more forest plantations be developed, more natural forests might be saved.

Field Exercise:

1. Name of the visiting forest plantation site:
2. Date of visit:
3. Locality:
4. Area (m²):
5. Observations:

Presence of prioritized tree species to the specific plantation sites:

S. No.	Tree Species		No.	Uses	Distance		Other Information
	Common Name	Scientific Name			Rows (m ²)	Plants (m ²)	
1.							
2.							
3.							
4.							
5.							
6.							
7.							
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14.							
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Time of planting:.....
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Maintenance of plantations:.....
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Harvesting operation:.....
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Conclusion:.....
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Objective: To visit nearby forest plantation site to estimate growing stock

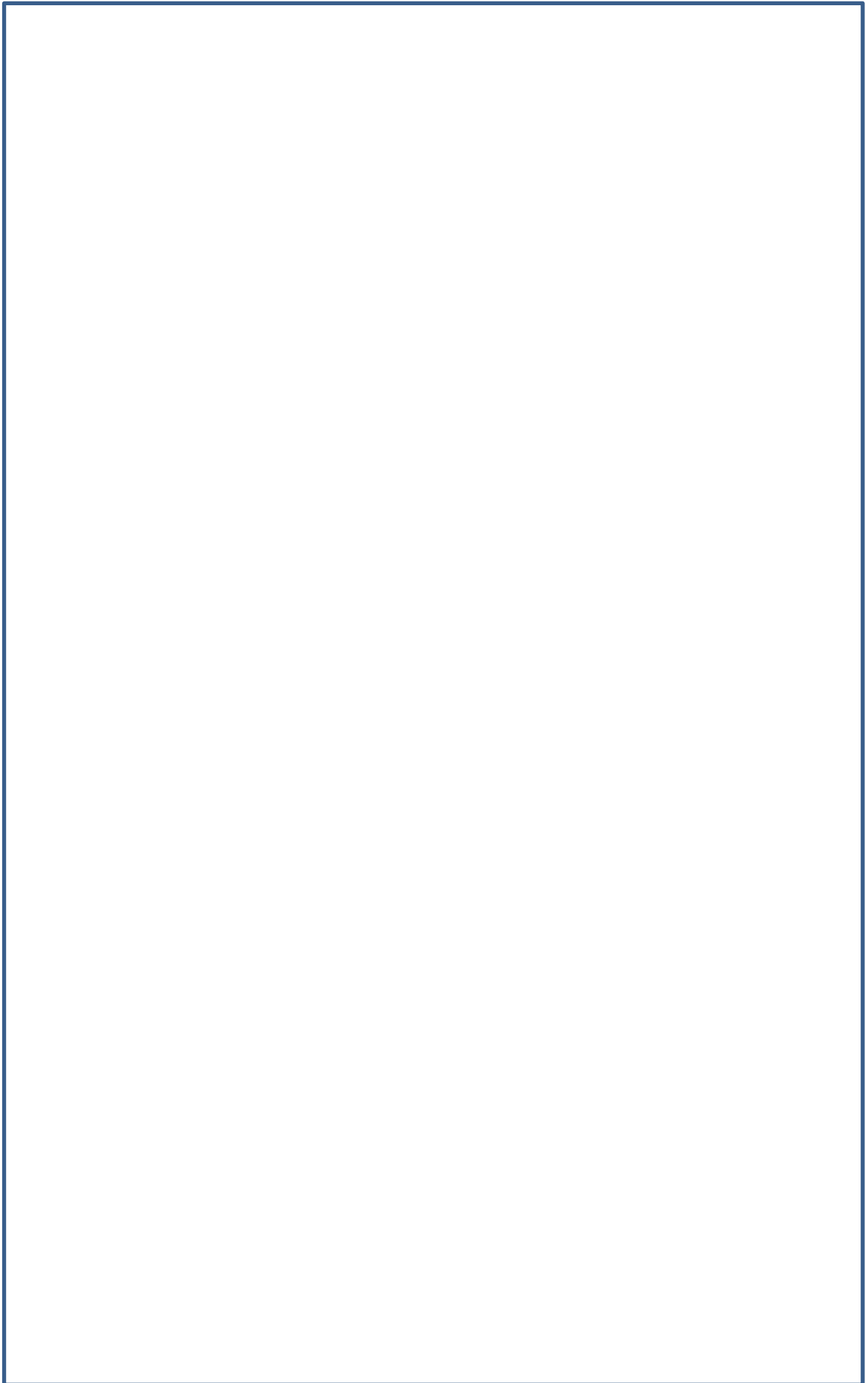
- Growing stock (GS) in a forest is the forest capital; the other basic factor of this capital being the forest soil. It is, however, ultimately the G.S. which gives the return (yield), which is the aim of every enterprise.
- It represents the investment of the owner (in case of Indian forests, generally the state) from which he receives the income.
- Ordinarily, any increase or decrease in the capital (GS), is immediately reflected in the income (increment/yield).
- Just as in a business enterprise, the investment may be over- capitalized, normally-capitalized or under-capitalized, in forestry enterprise also the G.S. (capital) may be over-stocked, normally-stocked or under-stocked.
- An over-mature and/or very densely stocked crop may have an excess GS to the extent that it is over- crowded, and not only the increment is retarded but even the excess GS may also gradually be lost by decay.
- Growing stock (GS) is defined as “The sum (by numbers or volume) of all the trees growing in the forest, or a specified part of it”.
- Normal growing stock (NGS) is defined as “The total volume of trees in a fully stocked forest with normal distribution of age-classes for a given rotation”.

Determination of actual growing stock

- Measurement of volumes of single trees and crops forms a part of the subject of forest mensuration.
- These may be determined by any of the following methods and with the help of volume tables.
 - i) **By total or complete enumeration:** Seldom practicable over large forest areas; practiced only in very valuable forests of limited extent.
 - ii) **By partial or sample enumeration:** Statistically acceptable methods are adopted for the purpose. This gives results which are reasonably accurate for the purpose.
 - iii) **By sample plot measurement:** In selected representative areas of the crop.

Field Exercise:

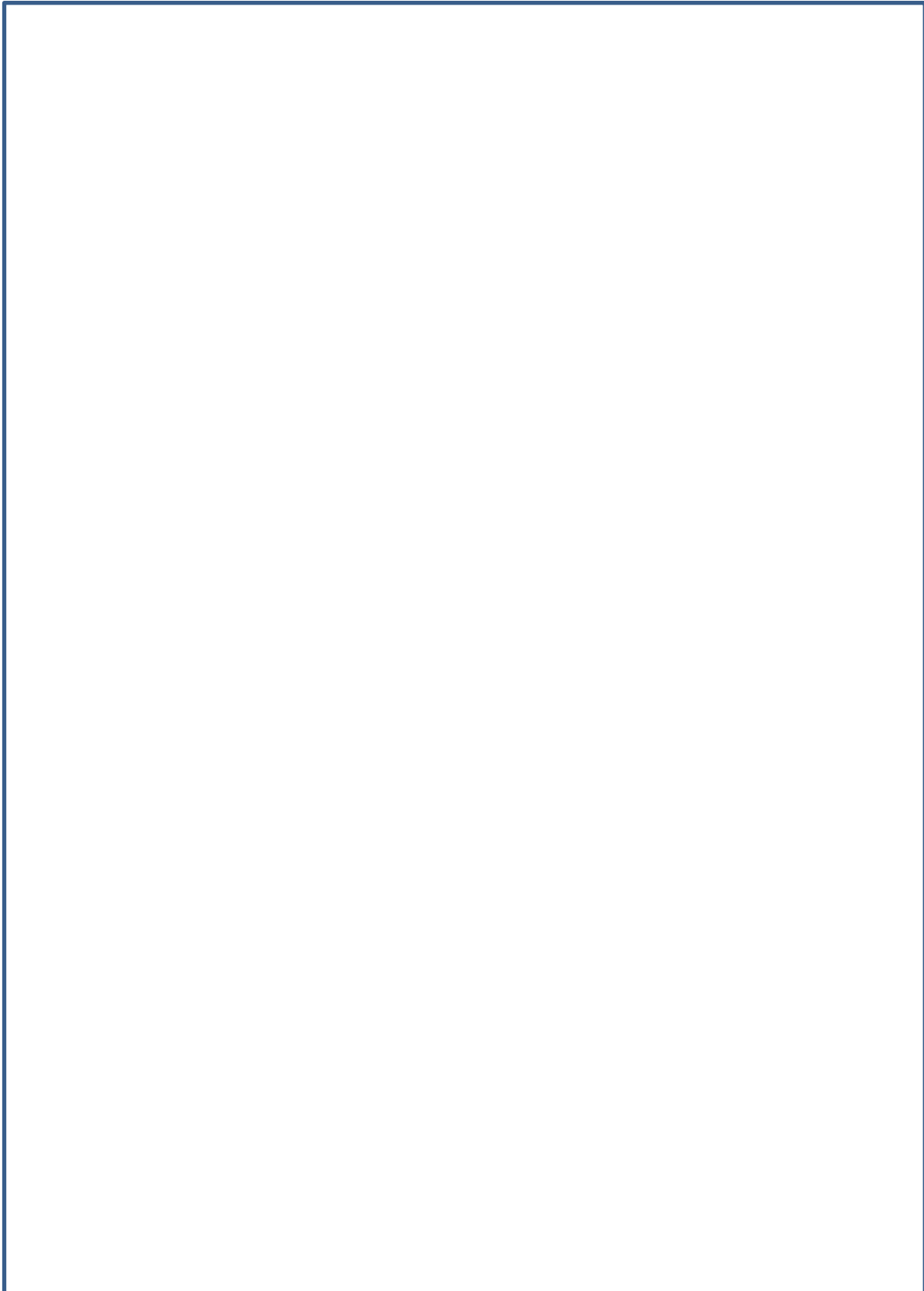
1. **Name of the visiting forest plantation site:**
2. **Date of visit:**
3. **Locality:**
4. **Area (m²):**
5. **Determination of volume of visited forest plantation sites:**



Practical No. 12

Objective: Visit of nearby forest plantation site to estimate growing stock

Determination of growing stock of visited forest plantation sites:

A large empty rectangular box with a blue border, intended for recording data or observations.

Objective: To undertake field visit in JFM operational areas

- JFM is a Break through Approach to Peoples Participation in Sustainable Forest Management
- Joint Forest Management often abbreviated as JFM is the official and popular term in India for partnerships for forest improvement involving both the state forest departments and local communities.
- The policies and objectives of Joint Forest Movement are detailed in the Indian comprehensive National Forest Policy of 1988 and the Joint Forest Management Guidelines of 1990 of the govt of India.
- Although schemes vary from state to state and are known by different names in different Indian languages, usually a village committee known as the Forest Protection Committee (FPC) and the Forest Department enter into a JFM agreement.
- Villagers agree to assist in the safeguarding of forest resources through protection from fire, grazing, and illegal harvesting in exchange for which they receive non timber forest products and a share of the revenue from the sale of timber products.

Origin

- Joint Forest Management originated in West Bengal in 1980's in Asia and Africa. The major hardwood of Arabari is sal, a commercially profitable forest crop.
- Ajit Kumar Banerjee, a silviculturist, working for the Forest Department as the Divisional Forest Officer, was conducting trials which were constantly being disturbed by grazing and illegal harvesting by the local populace.

Benefits of JFM:

- **Forest Protection**
- **Quality Execution of Work**
- **Change in Outlook**
- **Social Awakening**
- **Children Involvement in school has been increased.**
- **Income Generating Activity**
- **Women Development**
- **Other Departmental Work.**

Field Exercise:

1. **Name of the visiting JFM sites:**
2. **Date of visit:** **Day:**
3. **Locality:**
4. **Area (m²):**
5. **Geographical location:**
6. **Altitude:**
7. **Slope:**

8. Presence of multipurpose tree species in JFM operational area

S. No.	Tree Species		No.	Uses	Distance		Other Information
	Common Name	Scientific Name			Rows (m ²)	Plants (m ²)	
1.							
2.							
3.							
4.							
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9. Impact of JFM to the socioeconomic condition of peoples:.....

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10. Gender equity in JFM operational areas:

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Objective: To study Forest Working Plan

- Working Plan is the main instrument of forest planning and working for scientific management of forests.
- It is a very useful document for evaluating the status of forests and biodiversity resources of a forest division, assessing the impact of past management practices and deciding about suitable management interventions for future.
- A Working Plan (W.P) document is a means of enforcing systematic, obligatory and mandatory regulations for continuous management of a given forest property. The WP does not deal only with silvicultural and management aspects but also covers general administration, watershed management, conservation of biodiversity, soil and water conservation, wildlife etc. In short, a WP is a complete forest plan for the Working Plan period.
- Glossary defines Working Plan as a written scheme of management aiming at continuity of policy and action and controlling the treatment of a forest.

Working Plan, Working Scheme, Micro-plan

- Every working plan includes the specific scientific prescriptions for proper management of forests of a particular forest division.
- However, working schemes are prepared for smaller areas for a specific purpose or for forest areas under the control/ ownership of such bodies as private, village, municipal, cantonment, autonomous district council etc. These prescriptions should aim at developing forest resources, while meeting the requirements of the objectives of the National Forest Policy and other international conventions/agreements, and satisfying the provisions of the relevant statutes.

1. Goal and Objectives of Working Plan:.....

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2. Organizational Structure

At national level:.....

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At state level:.....

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3. Working Plan Period:.....

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4. Preliminary Working Plan Report(PWPR):.....

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5. Preparation and Finalization of PWPR:.....

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Objective: To study field data regarding Forest Working Plan

Survey and assessment of forest resources: Prerequisite for writing a working plan is to undertake survey and make an assessment of forest resources. Guidelines, in this respect, laid down in the National Working Plan Code 2014 are briefly mentioned below.

Steps	Description
Examination of territorial units	
Forest resource assessment	
Growing stock estimation	
Assessment of non-timber forest products	

Objective: To study writing up of Working Plan

PART- I (Summary of facts on which proposals are made)		
1.	Deals with general description of forest	
1.1	Name and situation	
1.2	Configuration of the ground	
1.3	Geology, rock and soil	
1.4	Climatic Parameters	
2.	Deals with flora and fauna	
2.1	General composition of crop	
2.2	Main forest types	
2.3	Injuries to which crop is liable	
2.4	Fauna	
3.	Deals with utilisation of forest produce	

3.1	Different forest products	
3.2	Utilization of forest produce by local population	
3.3	Rights and Concessions	
4.	Deals with staff and labour available in the forest division	
4.1	Government staff available	
4.2	Labors available on daily wages	
5.	Deals with past system of management	
6.	Deals with statistics about yield and growth	

Objective: To study writing up of Working Plan

PART II (Future Management)		
Chapters	Title / Sub-title	Explanation
1.	Deals with basis of proposals	
1.1	Objectives of management	
1.2	Method of treatment to be adopted	
1.3	Constitution of working circles	
1.4	Period of working plan and necessity for intermediate revision	
2.	Deals with constitution of working circles	
2.1	Name of working circle	

2.2	General constitution of working circle	
2.3	General characteristics of vegetation	
2.4	Felling series, cutting sections and JFM areas	
2.5	Blocks, compartments and JFM area (marked on GIS based maps)	
2.6	Special objectives of management	

FOREST ORGANIZATION

Forest are classified into various category for purpose of description, administration, management and record subdivision are-

1. Geographical and climatic (ecological) classification: Under this forest are divided into different forest type of India by Champion and Seth in 1968. They classify forest into broadly 5 major group and 16 subtype groups –

5 major groups:-

- ✓ Tropical
- ✓ Subtropical
- ✓ Temperate
- ✓ Subalpine
- ✓ Alpine

16 type groups:-

- 1) Tropical wet ever green forests
- 2) Tropical Semi ever green
- 3) Tropical Moist deciduous
- 4) Tropical- Littoral and swamp
- 5) Tropical Dry deciduous
- 6) Tropical Thom Forest
- 7) Tropical Dry evergreen
- 8) Sub Tropical Broad leaved hill Forest
- 9) Sub Tropical Pine Forest
- 10) Sub Tropical Dry evergreen
- 11) Mountain wet temperate
- 12) Himalayan moist temperate
- 13) Himalayan Dry temperate
- 14) Moist subalpine forest
- 15) Dry subalpine forest
- 16) Alpine forest

2. Functional classification: National forest policy 1952 suggest functional classification of Indian forest into -

- 1. Protection forest
- 2. National forest
- 3. Village forest
- 4. Tree land forest

NCA 1976 has modified functional classification as -

- 1. Production forest: Valuable forest, Mixed quantity forest and Inaccessible forest
- 2. Protection forest
- 3. Social forest

3. Legal classification: Broadly classified as -

- A) Reserved forest:** Reserved forest are classified under IFA (Indian forest act) or forest low. they are generally exclusive property of government are subject to complete protection, villagers have no right in these forests.
- B) Protected forest:** It is a legal term for an area subject to limited degree of protection and constitute as such under provision of Indian Forest act.
- C) Village forest:** It is state forest assigned to village community under provision of Indian forest act and manage for supply of forest produce to local people.
- D) Un-classed forest:** It is forest land owned by govt but not constitute into reserved, protected or village forest. These are generally heavily burden with right and are excessively grazed and felled and even burnt.

4. Territorial Classification: For executive & protective work, forests are divided into **block, compartment & sub compartments**

Block: It is main territorial division of forest generally bounded by natural feature & bearing local proper name. Each block has clear cut boundary all round it with numbered pillar.

Compartment: It is small permanent working plan unit of management. A block is divided into several compartment which are territorial unit of forest permanent defined for purpose of administration record designate by aerobic number (1, 2,3 etc.)

Boundaries are formed either by natural feature (ridge, valley bottom, streams) or artificial line (fire) size of compartment depends on intensity of management. Smaller the compartment easier it is to include area homogenous in site factor & forest type in each. In protection & selection forest working intensity is light & compartment is usually large in size.

Sub compartment: Sub compartment a subdivision of compartment generally (but not necessary) description & silvicultural treatment (designated by small letter a, b, c etc.)

4. Administration (organizational) classification

At central government level

- Director General (Forest)
- Inspector general of forest (IGF) head quarter, New Delhi
- Additional inspector general of forest
- Deputy inspector general

➤ Assistant inspector general

In charge of various works such as general administration, wild life, central forest commission, forest industries and social forestry etc.

Forest has now been included in concurrent list since 1976 central govt. has also some say in their management and control.

At state government level

State Forest Department and Administrative Unit	Office In-charge
State Forest Department	CCF
Circle	CF
Forest Division	DFO
Forest Sub-division	Sub-DFO/A.C.F
Range	RFO/R.O
Sub Range/Section/Block	Sub-R.O/B.O
Beat	Beat Officer/Forest Guard

6. MANAGEMENT CLASSIFICATION: The unit of forest management is working plan usually covering an area of forest division. Working plan is written scheme of management aiming at continuity of policy and action and control of treatment of forest.

Working circle: A forest area (forming the whole/ part of a working plan area) organized with a particular objective and subject to one and some silv. system and same set of working plan preparations.

Felling series: A forest area forming the whole/part of a w.c. to

1. Distribute felling and regeneration and suit local conditions
2. To maintain/create normal distribution of age classes. (when w.c. is undivided, it is F.S.)

Coupe: In clear felling system, a F.S. is divided into a number of annual coupes (annual felling areas), equal to no. of years in rotation. Size of each coupe = A/R ha (A=area (ha) of F.S. R=Rotation)

Cutting sections: A sub-division of F.S. for regulating cuttings in some specified manner. -A planned separation of fellings in successive years (4/5 years) (To avoid fellings for danger of fire, insect attack in successive coupes)

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.

Felling cycle: In an ideal selection forest the entire area will be worked every year and will represent a complete undivided felling series such as working of entire area of working circles neither practicable nor desirable. The usual practice is to divide the area into number of coupes (some time known as cutting section) each of which worked at an interval of planned number of years known as felling series.