Forest Inventory

1. Objective
2. Decide Sampling design
3. Sampling intensity
4. Laying out Plots in field
5. Inventory Report

Objective

- Natural Resources Survey

- Assessment of potential for forest and wood based industry development

- Wood based industry feasibility study.

- Management plan for a forest - long term and short term.

Types of Inventory

- Current Inventory
  - current growing stock, growth rate etc.

- Recurrent Inventory
  - Monitoring growth rate and other changes.

Planning and execution of Inventory

3 PBC

Policy

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Planning

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Programming

↓

Budgeting

↓

Control
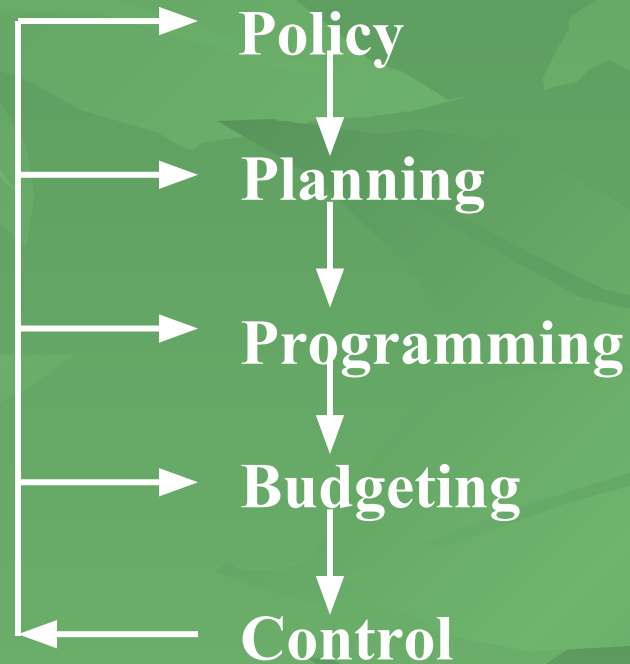
SAMPLING DESIGNS

Guided by

- **Objective of the inventory**

- **Desired precision**

- **Time and money available**

- **Topography & accessibility**

- **Availability of personnel and equipments**

- **Availability of satellite imageries, aerial photographs, and maps, data processing units.**

- **Results of previous survey**

Types of sampling plots

- Temporary sampling plots
- Permanent sampling plots

- **Temporary sampling plots:**
  - Generally used for the enumeration surveys
  - Measurements carried out once only

Permanent sample plots

- Permanent sampling plots can be used for:
  - Repeated measurements at regular interval
  - Used for preparation of yield tables.
  - To study the all stages of development of even aged crop
    - Including crop volume and increment.
  - To study the same type of crops in different localities.
  - To study the influence on crop increment of different methods of regeneration.

Selection of plots for permanent sample plots

- To cover all ages: different plots are taken
- Should encompass whole range of quality types and geographical distribution of the species.
- Plots laid in even aged pure and fully stocked plots
  - In absence of it plots taken in uniform stocking without large gaps and patchy growth
- Abnormal tree like edges not selected
- Plots must be subjected to the same treatment as the main crop
- Convenience and Cost should be taken care of

Sampling Intensity

- Defined as:

  (Area sampled/Total area) x 100

- In order to keep the sampling error less than 10% Griffith recommended following intensities

Type of forest	Percentage
Tropical wet ever green	10
Tropical moist deciduous	2.5
Sub-tropical pine forest	5

Sampling Intensity

- The percentage usually recommended for different terrains:-

Terrain	Method	% of sampling
Plains	Strip sampling Line plot of 0.05 ha circular plots	5 to 10 2 to 5
Hills	Topographical Units	20 to 25 if the area of the forest is more than 2000 ha.

This is only a rough guide

Sampling Intensity

- Circular plot method
    - For plains following table can be used

Net area of the forest unit	Enumeration intensity
Up to 10 ha	Total enumeration
11 to 50 ha	Minimum of 30 circular plots
51 ha and above	30 to 100 circular plots

Forest Inventory designs used in India: some examples

- For conversion to uniform working circle 10 % randomized strip enumerations

- In Pulp wood working circle (Eucalyptus)
  - Plantations of 10 years age and over – total enumeration
  - Plantation of 5-10 years – 20 %
  - Plantation below 5 years of age – 10%

National Inventory Design of FSI

- Each Toposheet(1:50000) is divided in to grids of 2.5' x 2.5'
- In each of these grids two square sample plots each of 0.1 ha area is marked (0.01%)
- With the help of toposheet, plot centers are located on ground
- Plots are then laid on ground having diagonals along north south and east west

Lay out of Plots in field

- Laying out surround
- Demarcation of plot boundary
- Marking cross marks
- Numbering of trees in the plot
- Preparing a plot chart
  - Showing layout of plot
  - showing trees in plot

Surround

- An area maintained around the Sample Plot
- Same treatment as the plot
- Advantage of surround
    - Provides sample trees if not available in plot
    - Ensures the same treatment to plot & other area
    - Protect the plot from damage
- It may not be of even width - but on an average it should be equal to height of the crop expected to reach at the end of experiment (at least 50 ft)

Demarcation and numbering

- Whole area including the surround – demarcated by painting white rings at b.h.
- Boundary line of the plots selected and marked by trench around it (or at corners)
- Corners of the plots should be marked by durable wooden post serially numbered
- No. of plot indicated on a board fixed near plot. The year of laying of plot should be mentioned.

Sample Plot file

- After laying out the samples, Demarcation and numbering of trees record the data
- Fill up various field forms
- Compile all the data and send for data processing
- Analyze the output and take management decisions

INVENTORY REPORT

- **<u>Part I</u>**
- ☞ **Objects - Feasibility in terms of money, time, topography, skills, etc.**
- ☞ **Sources of information**
  - ☞ **Primary - Pilot survey to collect data**
  - ☞ **Secondary - maps, A.Ps, sat. imageries, reports of prev. inventory**
- ☞ **Field measurements and ready reckoners**
- ☞ **Statistical considerations - Types of sampling, stats analysis**

Part I-contd.

☞Staff management

☞Training field teams

☞Field staff

☞Field instructions -for uniformity in collection of data

☞Field checks and controls - sampling within sampling

☞Management of inventory teams in the field

☞Calculations, analysis and data capture

☞Programmes, budgets and logistics.

<u>**Part II**</u>

- **Summary of the result and experience gained**

- **Emphasis on aspects like**

    - **Costs**

    - **Rate of progress in field work**

    - **Variance of diff parameters in diff crops**

    - **Success of recommended practices**