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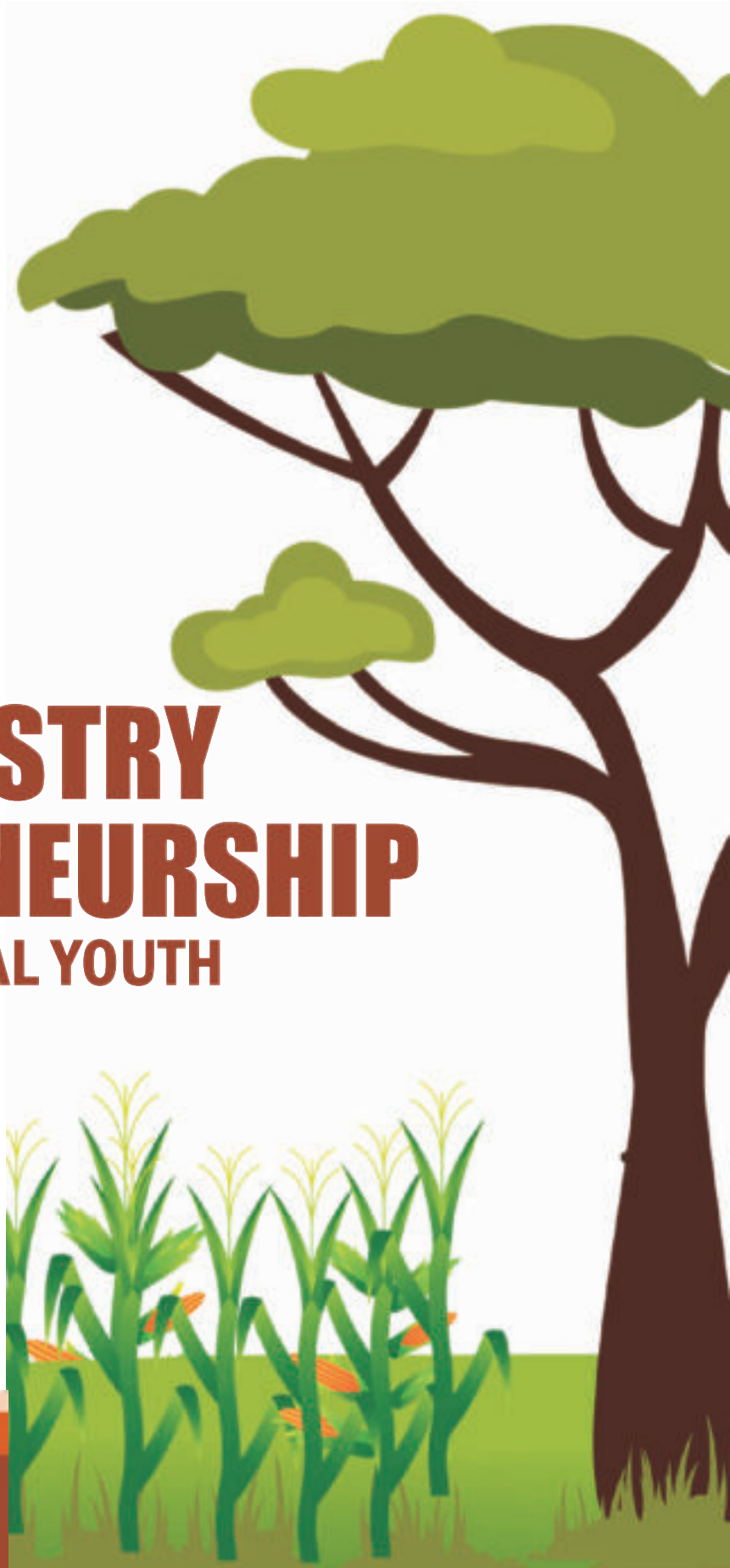

WORKBOOK FOR
AGROFORESTRY ENTREPRENEURSHIP
BUILDING OF RURAL YOUTH

Workbook for Agroforestry Entrepreneurship Building of Rural Youth

This publication is part of FAO-NRAA Technical Cooperation Project (TCP) on Support Implementation of National Agroforestry Policy by Enhancing Tree Cover & Production of Wood.

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Foreword

Agroforestry as a land-use system has the potential to strengthen the nation's response to the current economic & ecological challenges by producing food, fuel and fibre in an eco-friendly manner, Principally, agroforestry is the deliberate inclusion of woody perennials (including trees, shrubs and bamboo) along with agricultural crops and/ or livestock on the same piece of land. This tree- based food production system is an optimal approach to reaching maximum yields on the principles of resource use efficiency and ecological harmony. It also fits well with the important agenda of Sustainable Development Goals (SDG) 2030, one of which is efficient & sustainable "land-use". Agroforestry plays a substantial role in contributing to at least 12 out of 17 SDGs, realizing which the Government of India formulated the National Agroforestry Policy in 2014, the first of its kind anywhere in the world.

Upgrading of the agroforestry to universal scale warrants participation of various institutions & organizations and, therefore their capacity building assumes importance. Promoting participatory research and identifying drivers of change in different contexts can further accelerate the pace of scale-up. There is also a large potential for innovation in relation to extension services by using social marketing in effecting behavioural changes, and introduction of practices and products, *i.e.* creation of demand to render agroforestry as demand-led initiative.

The now available digital technology could as well be optimally blended with manpower based extension for greater efficiency in delivery of services.

Pursuant to the Union Government's comprehensive policy on agroforestry, several ministries & departments, and their agencies have stepped in with concerted efforts to promote agroforestry as an initiative for negotiating climate-change associated risk alongside reconciliation of economic needs of the farmers & ecological rejuvenation at the ecosystem level.

It is in this context, that National Rainfed Area Authority (NRAA) collaborated with the Food & Agriculture Organization (FAO-India) of the United Nations, ICAR- Central Agroforestry Research Institute (CAFRI), Jhansi, and the Indian Institute of Forest Management (IIFM), Bhopal in planning for and implementing a Technical Cooperation Project (TCP), called "Support implementation of National Agroforestry Policy (NAP) by enhancing tree cover & production of wood".

This TCP broadly addresses two critical issues, inclusive of i) designing and recommending a facilitative extension module; ii) delineation & development of tradable parameters for the selected timber & non-timber species identified in the states of Uttar Pradesh & Karnataka.

The agroforestry extension framework along with a ready reckoner including a training manual & workbook developed by ICAR-CAFRI encompasses a robust approach for adoption of appropriate agro- forestry extension strategies across the country. The extension training module developed covers all the processes involved in agroforestry form end to end – nursery (pre-planting) to planting & production to post-harvest management.

As regards the tradable parameters, the Report developed by IIFM, Bhopal suggests simple to adopt and easy to replicate traits, that are feasible for physical & online trade. This is facilitative of promoting the sustainable & viable use of selected timber& non-timber species in both the states. Further, there exists scope for replication of the same in other states too.

This Study is a unique attempt for promoting the agroforestry based on robust extension & appropriate post-harvest practices. This approach is expected to have a distinctive impact on the understanding and interpretation of agroforestry operations by grass root level functionaries individuals and farmers.

The effort has been cooperative & coordinated, and therefore the outcome is suitably applicable at field level. The results can be expected to generate substantive interest at government level, which envisions to scale up agroforestry as a peoples programme.

I place on record the sincere effort and innovative approach brought to bear upon this unique project.

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Message

The National Agroforestry Policy adopted in 2014 made India a trend setter in agroforestry research and implementation. The policy called for the development of dedicated agroforestry extension framework to boost the sector in different states. ICAR-Central Agroforestry Research Institute (ICAR-CAFRI) got the opportunity to develop the Agroforestry Extension Framework in collaboration with FAO and NRAA through several rounds of consultations with important stakeholders. While the extension framework envisages in capacity building and strengthening the existing extension machineries such as KVK's. VVK's, ATMA and state agricultural departments, and the institutional arrangement made for implementing the objectives of Sub-Mission on Agroforestry (SMAF), the authors felt the need to have a Training Manual and a Workbook to have complete exercise of extension mechanism from field to market. The ICAR-CAFRI along with other associates therefore designed and brought out this workbook as an extension of the training manual that can be used for training the extension personnel across the country to boost agroforestry.

This agroforestry workbook contains the holistic plan for developing agroforestry in different states and highlights the narration of the designs and agroforestry models for farmers' field. Further, the document emphasizes the information on the entrepreneurship aspects and value chain development with regard to agroforestry. In the process, the role of ICAR applications in agroforestry extension has been detailed. As a backup, various initiatives of the Government of India for agroforestry development have been highlighted, along with other supporting information on the package of practices, tree nurseries and propagation techniques of agroforestry species.

The document has been prepared as a part of Letter of Agreement under the FAO Technical Cooperation Programme (TCP/IND/3710) on “Support Implementation of National Agroforestry Policy by Enhancing Tree Cover & Production of Wood".

It is believed that this Workbook shall benchmark the capacity building activities for different stakeholders involved in agroforestry extension and help effective implementation of agroforestry projects and programmes in India for ensuring livelihood and environmental securities *per se*.

- Director, ICAR-CAFRI

Acknowledgement

We are grateful for the financial support provided by the Food and Agriculture Organization of the United Nations (FAO) and National Rainfed Area Authority (NRAA), Govt. of India in the form of Letter of Agreement under the Technical Cooperation project (TCP/IND/3710) on "Support Implementation of National Agroforestry Policy by Enhancing Tree Cover & Production of Wood". Owing to which, the ICAR-Central Agroforestry Research Institute enabled this Workbook as an extension of the Manual for Agroforestry Entrepreneurship Building amongst rural youth. The information compiled in this document is from individual/institutional experiences and secondary information sources on the promotion of agroforestry in order to capture the field level information. Our effort has been to bring all available information for its utility to develop one single document for anyone to have it as a ready reckoner for capacity building in agroforestry extension. The guidance received from Dr. Ashok Dalwai, CEO, NRAA; Shri Tomio Shichiri, FAO Representative in India, Dr. S.K. Chaudhari, Deputy Director General (NRM), Indian Council of Agricultural Research; Dr. S. Bhaskar, Assistant Director General (AA&CC) and Dr. B.P. Bhatt from NRM Division of ICAR HQ; Shri Illias Animon, Forestry Officer, FAO Regional Office of the Asia Pacific, Shri B. Rath, Technical Expert (WM), NRAA, Ministry of Agriculture & Farmers Welfare. Shri R.B. Sinha, Senior Policy Advisor (Natural Resources), FAO, Dr. Konda Reddy, Assistant FAO Representative in India and Dr. Divya Shah, NRM & Biodiversity specialist, FAO, Ms. Athira Sobhana, Project Associate, FAO, is thankfully acknowledged. The comments received from experts from FAO, NRAA and independent consulting experts - Prof. Atul, Dr. V.V. Sadamate and Dr. B. Lakshmi, ASCI, Hyderabad have helped in improving the document. The information available in the public domain of various internet sites, authors, institutions, and publications used in this workbook are thankfully acknowledged. In all, I thank all those who directly or indirectly contributed to the implementation of activities under this Letter of Agreement including the State Forest Departments, State Agricultural Universities and KVKs

- Director, ICAR-CAFRI

Abbreviations and acronyms

ASCI	Administrative Staff College of India
AA&CC	Agronomy, Agroforestry and Climate Change
Co_2	Carbon Dioxide
cm	Centimeter
CAFRI	Central Agroforestry Research Institute
CEO	Chief Executive Officer
DBT	Department of Biotechnology
FP	Felling Permission
FAO	Food and Agriculture Organization of the United Nations
GOI	Government of India
ha	Hectare
HQ	Headquarter
IFA	Indian Forest Act
Kg	Kilogram
KVK	Krishi Vigyan Kendra
Mpts	Multipurpose Tree
NAEB	National Afforestation and Eco-Development Board
NCS-TCP	National Certification System for Tissue Culture Raised Plants
NRAA	National Rainfed Area Authority
NRM	Natural Resource Management
NMSA	National Mission for Sustainable Agriculture
N	Nitrogen
NGOs	Non-Governmental Organization
NTFPs	Non Timber Forest Produces
pH	Potential of Hydrogen
PSUS	Public Sector Undertakings
QPM	Quality Planting Material
SFD	State Forest Department
SWOTS	Strengths Weaknesses Opportunities Threats
SACCOS	Saving and Credit Cooperative
Sps	Species
SMAF	Sub-Mission on Agroforestry
TP	Transit Pass

1. How to Plan and Develop an Agroforestry Plan?

Developing a plan may seem tedious at the beginning, but the long-term benefits far outweigh the difficulties of plan creation. By having a plan, landowners can better envision how to successfully integrate an agroforestry practice to their farm. And the planning process also will help develop a familiarity with the management required to reach the goals, objectives, benefits, and economics desired. The best way to ensure success is by thoughtful and honest planning.

Personal Assessment

1.1. Exercise Step 1: Initial Objectives and Priorities

Rank (X) the following management objectives according to your land-use priorities (low, medium, high). Remember these objectives are a starting point, and you can (and probably will) modify them later. If possible, numerically rank the top five objectives for your agroforestry project (1=highest to 5=lowest priority).

Objective	Low	Medium	High Top 5
A new source of income from unproductive land			
Reduce costs of current farm or forest operations			
Develop new source of long-term income (*i.e.*, timber)			
Increase short-term income while awaiting long-term timber income			
Tax advantages			
Increase grazing opportunities			
Increase wildlife opportunities			
Undertake environmental improvements			
Access to govern- mental programs and cost-share			
Other			

1.2. Exercise Step 2: Evaluate Personal Resources

What resources – in addition to your land base – do you have that could be put into your agroforestry development? The section below allows you to list and evaluate the resources of all the family members who will be involved and that you think will have an impact on your ability to develop this agroforestry area.

Resource	Landowner use and potential of resource
1. Management time - When will the new activity not be in conflict with existing activities?	
2. Labor - Times of year when labor is most available.	
3. Equipment and facilities - For animals, storage, value-added processing, time of year available.	
4. Specialized farm equipment - Identify special farm equipment, such as tractors, ATVs, spray equipment, *etc.*	
5. Irrigation - Water source available.	
6. Plant material - Your own sources of seed, seedlings, cuttings and larger trees, or will you need to purchase them?	
7. Livestock - Cattle, sheep or other animals. What are their needs, and when are those greatest (*i.e.* calving)?	
8. Materials - Sawdust or shavings, manure and straw, or pine straw, for mulch, *etc.*	
9. Other	

1.2.1. Exercise: Can I meet my labour and management needs?

What resources – in addition to your land base – do you have that could be put into your agroforestry development? The section below allows you to list and evaluate the resources of all the family members who will be involved and that you think will have an impact on your ability to develop this agroforestry area.

	Total hours for year	Distribution of hours (for one year or for production period)			
		Jan-Mar	Apr-June	July-Sept	Oct-Dec
Suggested hours, full-time worker (~ 40 hours/week)	2,000	500	500	500	500
My estimate, cost of wages, full-time worker (Rs./hr. min. wage as per rates)					

		Labor and management hours available			
Principal Manager					
Team Member 1					
Team Member 2					
Team Member 3					
Hired Labor					
Total Hours Available					
		Direct labor and management hours needed by enterprise			
Enterprise 1					
Enterprise 2					
Enterprise 3					
Total labour hours needed					
Total labour hours available (from above)					
Additional labour hours required (total hours needed minus total hours available)					
Excess labour hours available (total hours available minustotal hours needed)					

Biophysical Site Assessment

1.3. Exercise Step 3: Identify Current Land Uses

List present uses of each part of your land and the products you harvest. Possibilities include: residential, recreation, farming (which crop), grazing (type of livestock), timber production, nontimber production, wildlife areas and green belts.

Land Use	Product/Resources Available
1. Residential	
2. Recreation	
3. Farming (list crops)	
4. Grazing Livestock (type)	
5. Timber Production	
6. Non-Timber Production	
7. Wildlife Areas	
8. Green Belts	
9. Other	

1.3.1. Exercise: Inventory your land and natural resources

1.1.1.1. Agricultural land resources: Cropland and pasture

Who can help? Your local extension agent or Agroforestry Extension Service Provider or State Technical support office can look at your property, indicate whether your present farm-management plan is, and recommend other options that could enhance your operation. Cost share programs or the sale of your agricultural development rights are other options that may be of value to you.

Number of acres of tillable land	
Number of acres of pasture	
Number of acres left fallow	
Number of acres you farm	
Number of acres rented	
Current crop(s)	
Rabi Season Crop	
Kharif Season Crop	
Number of head of livestock	
Total annual rental income from land rented to others who grow crops	
Total annual rental income from land rented to others who raise livestock	

Tick on the columns / fill your information below:

Fertility of land, agricultural crops:	Excellent	Good	Poor
Fertility of land, forests:	Excellent	Good	Poor
Total annual income from pasture and livestock			
How much of the annual pasture and livestock income is from land rented to others? Rented from others?			
Total annual income from cropland			
How much of the annual cropland income is from land rented to others?			
Rented from others?			

1.3.2. Natural resources: Forest

Who can help? You may want to contact a state forester to assist you with the inventory and evaluation of your forest resources. He or she can advise you on the procedure for developing a forest stewardship plan. In all states, they can provide names of private consultant foresters to assist with a timber sale or assess the potential of your forest under different management options.

Total number of acres of forest	
Three most common tree species (oak, poplar, pine, hickory, *etc.*)	
Do you have a written forest management plan?	Yes / No
If yes, what year was it prepared?	
Have your property taxes been reduced because you are enrolled in a land-use-tax assessment program for forestry?	
What nontimber forest products, if any, are present on the property? (Include edible and medicinal plants, decorative or floral products, specialty wood products, and native wild plants.) Have you or has a past owner sold timber to a commercial timber harvester?	Yes / No
If yes, when?	_____
How many acres?	_____
(Developing a forest stewardship plan will provide the information to answer the last two questions.)	
How many acres of forest could a commercial operator potentially harvest during the next five years?	

Within the next five years, what is the estimated income from a commercial timber harvest(s) that is compatible with your forest stewardship objectives?

1st Year	
2nd Year	
3rd Year	
4th Year	
5th Year	

1.3.2.1. Natural resources: Aesthetic or intangible resources

List locations on your property that have aesthetic appeal and could be developed for recreational enterprises, such as vacation cabin or hunting camp. Unique locations include rivers, streams, scenic overlooks, rock cliffs and wetlands.

1.3.2.2. Water resources

If you have more than one pond, or spring, assess each.

Who can help? For assistance with evaluating your water resources, you may want to contact your local cooperative extension office. An extension agent should be able to direct you to a water-quality specialist in your area.

1.3.2.3. Ponds

Pond size (in acres)
Maximum pond depth (in feet)
Maximum summer water temperature at 2 feet
pH
Alkalinity (in parts per million)
What type of fish live in the pond?
Do livestock have full access to the pond?
Does livestock waste drain into the pond?

1.3.2.4. Streams/Rivers

Stream width
Stream depth
Does the stream run all year?
What type of fish live there?
Do livestock use the stream or does livestock waste run into the stream?
Is the stream bordered by forest of at least 25 feet in width along each side?

1.3.2.5. Springs

Number of springs on the property
Rate of flow of largest spring (gallons per hour)

1.3.3. Exercise: Buildings, houses, barns and other structures

List size, age, condition and the cost to convert or upgrade structures for use in the enterprise.

1.3.3.1. House

1.3.3.2. Barn 1

1.3.3.3. Barn 2

1.3.3.4. Other

List rental cost and location of any available public or private structures or facilities that you can use for your enterprise (*e.g.*, kitchen, storage facility, or processing facility).

1.3.4. Exercise: Machinery and equipment

For each piece of equipment (tractor, chainsaw, wagon, rototiller, backhoe, bulldozer, *etc.*), list make, horsepower, age, condition, attachments, or other relevant information

1.
2.
3.
4.

1.3.5. Exercise: Use of by-products of farm/forest operation

Is animal manure produced from the farm operation?	
Can it be used onsite?	
List other by-products, if any, from farm operations	
Can they be used onsite?	
How and where?	
Are limbs and other wood from a recent timber harvest currently available for use?	
What is the type and quantity of this material (*e.g.*, cords of firewood that it would produce and number and species of vines)?	

1.3.6. Exercise: Labour and management resources

Time for management and labour involved in an enterprise must come from the team members or from outside sources. The opposite chart will help team members determine how much time they have available during each quarter of the year for management and labour activities. The time available can be on weekends or weekdays. Completing the chart will help you look at your time realistically and determine whether the enterprises you are investigating are compatible with the time you have available

	Hours by season and time of the week				
Resource person	Total hours	Jan-Mar	Apr-June	July-Sept	Oct-Dec
	avail/	Weekday/	Weekday/	Weekday/	Weekday/
	year	Weekend	Weekend	Weekend	Weekend
Management/ labour					
Labour					
Potential labour sources outside team					

1.3.7. Exercise: Financial resources

How much start-up money can you raise by using personal or family resources?											
Where will the start-up money come from ? Tick below											
Personal		Savings,		family member		farm credit		bank		cooperative	
Any other give brief details											
Do you plan to borrow money from a bank for the enterprise?									Yes / No		
Is there a grant program that could provide some start-up money?									Yes / No		

1.3.8. Exercise: Special skills that are commonly overlooked

If you or any of your team members have any of the following skills or experience, fill in the names. Also, add the names of relevant agencies or organizations with which you or your team members may have connections (such as cooperative extension, university agricultural experiment stations, state department of agriculture, and state forestry agencies).

1.3.8.1. Marketing skills

Name of person	Short description of skill/experience

1.3.8.2. Computer skills

Name of person	Short description of skill/experience

1.3.8.3. Production skills

Name of person	Short description of skill/experience

1.3.8.4. Sales ability

Name of person	Short description of skill/experience

1.3.8.5. Communicating skill

Name of person	Short description of skill/experience

1.3.8.6. Special skills, such as innovative thinking

Name of person	Short description of skill/experience

1.3.8.7. Special skills, such as innovative thinking

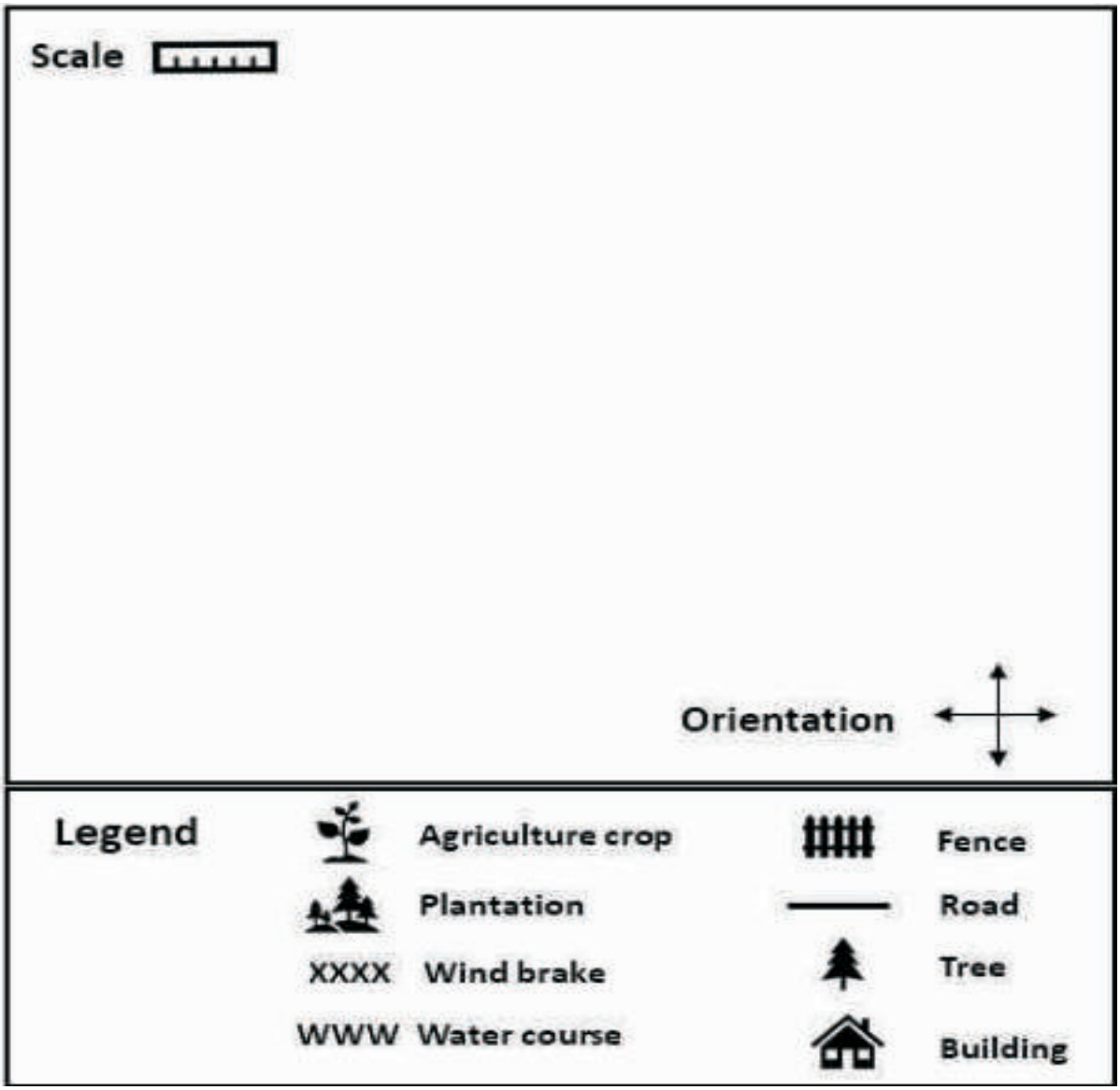
Name of person	Short description of skill/experience

1.3.8.7. Other (list skill)

Name of person	Short description of skill/experience

1.4. Exercise Step 4: Map Area(s) for Agroforestry Development

Using the legend, draw a sketch map of your agroforestry development area in the space below. This map will be used to mark the locations of areas that have various advantages and limitations. Note key reference points, such as roads, boundaries and buildings and include:



Source: Prof Dr Atul - Preparing, sketching 2D designs

Existing land uses – such as crop fields, pastures, stands of trees

Be sure to label with a scale and orientation arrow

Physical features – like steep slopes, rock outcrops, streams and pond

1.5. Exercise Step 5: Climate Assessment

Simply stated, the site assessment provides an overall measure of a land area's ability to support, or grow, a desired plant. Therefore, as a part of this assessment, the biological areas that will be considered include the climate, the soils and the land's physical features, sometimes called the topography or terrain.

1.5.1. Development Area

Hardiness Zone:	
Include frost-free days	
First and last frosts	
Indicator Plants	Number of plants
Name of the plants	
Other Useful Climate Information:	
Mean annual rainfall	
Mean annual snowfall if any	
Average temperatures	
Open ground:	
Summer	
Spring	
Winter	
Any other information of site specific	

1.6. Exercise Step 4: Map Area(s) for Agroforestry Development

Using the legend, draw a sketch map of your agroforestry development area in the space below. This map will be used to mark the locations of areas that have various advantages and limitations. Note key reference points, such as roads, boundaries and buildings and include:

Development Area	Soil Type(s) if Known
1. Soil texture and composition:	
Sand and gravel,	
loam,	
silt and clay,	
organic layer (depth).	
2. Soil depth:	
Include rock outcroppings and	
hardpan (depth of soil cover),	
rockiness.	
3. Soil moisture:	
Particular note of wet areas	
Flooding (with time of year).	
4. Soil nutrients:	
pH,	
Salinity,	
Fertility (attach soil reports from local Soil testing dept.).	
5. Aspect:	
Especially south vs. north facing.	
6. Terrain relief:	
Slope,	
Steepness,	
Gullies.	
7. Soil stability:	
Presence of high risk indicators such as	
sheet, rill or gully erosion.	
8. Frost pockets.	
9. Roots, stumps and other debris in or on soil	

1.7. Exercise Step 7: Physical Features (Terrain)

There are a number of physical features, or topography characteristics, that can influence the capability of your land to produce particular crops on a site. Because physical features are often closely related to soil characteristics, the information you obtain for each of your agroforestry development areas should be entered into the same table as the information from Step 6: Soil Assessment.

In combination, the terrain relief and aspect create a lay of the land that often will enhance the opportunities for a successful agroforestry practice. By listing unique land features you will be better able to place practices and plant species to the landscape to best ensure their survival and growth. For example, slope is very important in relation to the moisture available for plant growth. In general, north-facing slopes will have better moisture than south-facing slopes that are typically drier.

1.8. Exercise Step 8: Timber and Non-Timber Forest Crop Inventory

In addition to telling you what products you might have for sale, the number and quality of plants revealed by your vegetation inventory will provide additional information on site conditions. Photocopy and fill in for each development area

1.8.1. Timber Inventory Summary

Development area:	
Area (ac):	
Plot numbers:	
Plot Area (m^2):	
Plots/ac:	

Tree Inventory					
Tree species	Percentage of each	Age (optional)	Height (optional)	Crown closure (%age)	Density (trees/ ha)

In addition to what products you might have for sale, the number and quality of plants revealed by your vegetation inventory will provide additional information on site conditions. Photocopy and fill in for each development area/site.

1.8.2. Non-Timber Inventory Summary

Development area:	
Area (ac):	
Plot #s:	
Plot Area (ft^2):	
Plots/ac:	

Non-Timber Inventory					
Harvestable species	Total number of plants (each species)	Cover (%) (each species)	Harvestable vs. non (%)	Size of plants	Information on plants outside plots

Agroforestry Development Ideas

1.9. Exercise Step 9: Agroforestry Ideas – Brainstorming

List your agroforestry ideas separately for each development area. An additional category (Associated Practices) is provided for systems that are not real agroforestry systems, such as hybrid poplar plantations.

Development Area	Agroforestry Ideas
1. Forest Farming	
2. Alley Cropping	
3. Silvi-pasture	
4. Forest Buffers	
5. Windbreaks	
6. Associated Practices (*e.g.*, Poplar plantations etc)	
7. Other ideas for integrating forest practices on the farm	

1.9.1. Exercise: Assessing your resources, goals and possible enterprises

1. Describe the long- and short-term goals that you and your team hope to achieve by starting this new enterprise.

(a) Long-term goals

1.	
2.	
3.	
4.	
5.	

(b) Short-term goals

1.	
2.	
3.	
4.	
5.	

2. List the family members or team members who want to be actively involved. Describe each person's responsibilities.

1.	
2.	
3.	
4.	
5.	

3. Specify how much time each week you and your teammates will have available to spend on your new enterprise.

4. How much money can each team member provide now to initiate the enterprise?

Important:. Read and fill in number 5 only if you currently run a natural resources-based enterprise; otherwise, go to number 6).

5. Check the responses that best characterize your business goals during the next 3 to 5 years for your current enterprise. Answer any follow-up questions.

i)	Maintain at about the same level as in the past
ii)	Expand. How?
iii)	Get out altogether. Why?
iv)	Other:

6. The following information will help you determine your financial goals for any current or new enterprise. List the yearly income (you and your family or teammates) expect from the sources listed below:

i)	Current farm/forest enterprises	Expected Income
ii)	New enterprise (once it is established)	
iii)	Non-natural-resource employment (current job)	
vi)	Other	
v)	TOTAL	

1.10. Exercise Step 10: Listing 'Best Bets'

The list you make in this step should include all the plants that can grow on your land, and the products that can be derived from them. This list represents a summary of the information you have gathered so far. Photocopy the table below if you are assessing more than one development area. It is also very useful to consider which Government (State and Central) Programs are available to provide funding incentives for a broad range of agroforestry activities, from practice establishment through value-added and product marketing.

Development Area	Available Government Incentive Programs:	
'Best Bet' Plants	Potential Products	Volumes (indicate when available)

1.10.1. What will it take to produce my product or service?

You will probably have to make some capital purchases, such as buying buildings, equipment or land and making major improvements, to start your new business. List the capital purchases and their costs.

What will be your major production tasks, such as planting, harvesting, building, advertising, sales and maintenance? Describe the tasks according to the month they should occur. Also indicate which months you expect to receive income.

Month	Task	Month	Task
January		July	
February		August	
March		September	
April		October	
May		November	
June		December	

1.10.1.1. Relative merits of various enterprise ideas

Criteria	Enterprise ideas*
Total	

1.10.1.2. Example for Relative merits of various enterprise ideas

Criteria	Enterprise ideas*(Give your score in parenthesis)					
	Nursery raising	Agroforestry Model development	Product development	Agriculture Enterprise	Forestry Enterprise	Service Provider enterprise
Compatible with residency status	10	10	7	10	10	
Preferred by family	9	6	7		9 3	
Meets financial goals	9	9	5	10	9	
Uses underused physical resources	4	9	8	6	8	
Uses management/ labour/ manpower resources	8	6	5	3	6	
Potential market exists	10	5	9	10	6	
Uses farm, forest by-products	9	9	3	7	5	
Family financial resources available	10	8	10	4	8	
TOTAL	69	62	54	59	55	

Evaluate the 'Best Bets' in the context of the Industry

1.11. Exercise Step 11: SWOT Analysis

Start the evaluation with an assessment of internal factors (strengths and weaknesses) and external factors (opportunities and threats). (Refer to the Module – Marketing Principles for this exercise)

Internal Factors	External Factors
Weaknesses	Threats
Strengths	Opportunities

1.12. Exercise Step 12: Porter Five Forces Model

Identify potential barriers to entry, information about suppliers and buyers, competition and substitute products, and summarize the information in the following worksheet. (Refer to the Manual – Marketing Principles for this exercise)

Potential entrants (Barriers to entry)

Suppliers - Bargaining power of suppliers
Buyers - Bargaining power of buyers
Substitutes
Competitors

1.12.1. Identify barriers to entry

Development Area	Available Government Incentive Programs
Crop/Product	Critical Resources Needed

1.12.2. Identify suppliers and supply availability

Development Area	Available Government Incentive Programs		
Crop/Product	Supply Needed	Supplier	Information about supply (quality, availability)

1.12.3. Identify buyers and their needs

Development Area	Available Government Incentive Programs	
Crop/Product	Buyer (and reasons)	Buyer needs

1.12.4. Identify substitute products

Development Area	Available Government Incentive Programs		
Crop/Product	Unique characteristics of product	Substitute product	Unique characteristics of substitute product

1.12.5. Researching the competition

Development Area	Available Government Incentive Programs	
Crop/Product	Competitor	Competitor Info

1.13. Exercise Step 13: Revising Your 'Best Bets'

Development Area	Available Government Incentive Programs	
'Best Bet' Plants	Marketable Products	Volumes (indicate when available)

1.14. Exercise Step 14: Select and Describe Target Market(s)

Complete this worksheet for each major product you plan to produce. Develop a profile of the customer(s) you intend to target by market segment.

Development Area	Available Government Incentive Programs		
Product	1	2	3
Customer Segment			
Geographic			
Demographic			
Psychographic			
Needs/ Preferences			

1.15. Exercise Step 15: Adding Value to Products

List the 'pros' and 'cons' of each value-added activity you are considering.

Development Area	Available Government Incentive Programs:		
Plant/Product	Value-Added Opportunity	'Pros'	'Cons'

1.16. Exercise Step 16: Getting Products to the Buyer

Use the table below to outline how you will get each of your products to buyers. The three main factors to consider are:

List the 'pros' and 'cons' of each value-added activity you are considering.

1. Location: Where will you sell your product?			
2. Distribution: Which sales channels will your product follow?			
3. Transportation: How will your product reach the buyer?			
Development Area	Available Government Incentive Programs		
Product	Location	Distribution	Transportation

1.17. Exercise Step 17: Setting the Price

For each product on your 'best bets' list, establish a realistic price or price range. Photocopy the table below if you are assessing more than one development area.

Development Area	Available Government Incentive Programs		
Product	Price Range	Product	Price Range

1.18. Exercise Step 18: Promoting Your Products

Complete this worksheet for each major product you plan to produce. Choose a promotion approach for each customer segment. (Refer to Manual – Marketing Principles for this exercise)

Development Area	Available Government Incentive Programs		
Product	1	2	3
Customer Segment			
Message			
Tools			
Frequency			
Cost			

Agroforestry Practice Design and Management

1.19. Exercise Step 19: Revisit Your Objectives and Priorities

List your top five land management goals (see original objectives listed in Step 1):

Top Five Land Management Goals:

1.	
2.	
3.	
4.	
5.	

1.20. Exercise Step 20: Detailed 'Best Bets' Crop Information

Use the table to summarize everything you know about each plant you plan to grow in one agroforestry development area. You can photocopy the table below so that you have one for each crop plant.

Crop Plant:	
Agroforestry practice (best produced in)	
Where produced (in development area)	
Shade (requirement or tolerance)	
Soil and water (requirement or tolerance)	
Particular plant needs (to produce needed quantity and quality)	
Labour required to grow and harvest (amount and time of year)	
Resource use fit (time, labour and other resources with other activities)	
Compatible crop plants (can be grown with or should not be grown with)	
Compatible livestock (animal and useful interaction)	
Harvest requirements (*e.g.*, by hand, machine, cut tops, dig)	
Post-harvest requirements (*e.g.*, storage, drying)	
Packaging and shipping requirements	
Cost to grow and harvest	
Product(s) on market	
Current market price	
Profit potential	
Volume (potential production)	
Grade standards in market	
Product influences and trends	
Value-added opportunities	
Other	

1.21. Exercise Step 21: Designing Your Agroforestry Practice

Depending on the size of your operation, you may be able to put your entire development area on one table, or you may need several. Photocopy as required. You will want to create a separate table for each development area

Development Area	Available Government Incentive Programs	
Crop Plant(s)	Agroforestry Practice	Management Required (to grow marketable quality)

1.22. Exercise Step 22: A Five-Year Management Projection

Using the information compiled in your Workplan, complete the following table. Depending on the size of your operation, you may wish to complete one table for each proposed system. Photocopy this table as required.

Development Area	Available Government Incentive Programs		
Size of Area	Practice and Associated Crop	Year	Management Objectives

1.23. Exercise Step 23: Yearly Activity Schedule

This table will represent the work you plan to do in the coming year to develop your agroforestry practice. You should fill in a table for each agroforestry practice. Photocopy as necessary. Be prepared to revise this schedule as necessary.

Agroforestry Practice	Government Incentive Program Special Requirements:			
Time of Year	Management Objective	Specific Tasks	Materials	Labor and Equipment

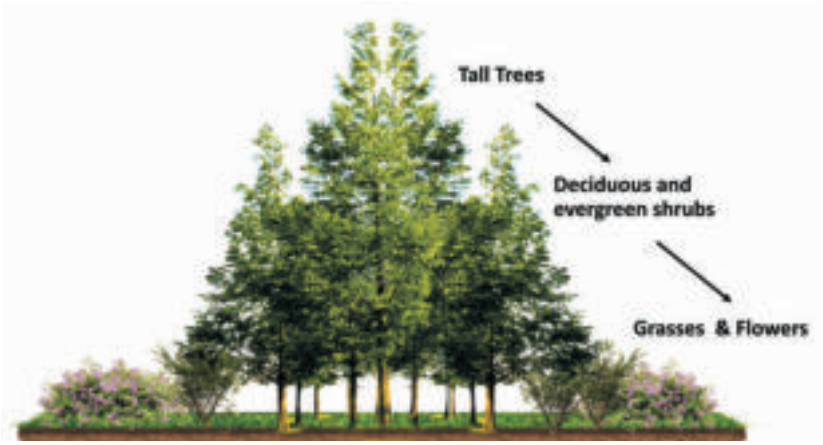
Notes if needed after the above exercise.

2. How to Develop and Design Agroforestry Model at Farmers' fields?

The structure of an agroforestry system can also be defined in terms of its components and their expected roles. This classification considers the composition of the components, including a spatial mixture of the perennial woody component, vertical stratification of the component mix and a temporal arrangement. Examples of this classification are found in table in the capacity building manual. Agroforestry systems are classified into two levels: Agroforestry at plot or farm level, Agroforestry at landscape level.

Agroforestry at plot or farm level:

2.1. Figure 1: Agroforestry Hedgerow System



Generally, at plot or farm level, agroforestry systems can be classified into two types:

2.2. Figure 2: Simple agroforestry

2.3. Figure 3: Complex agroforestry

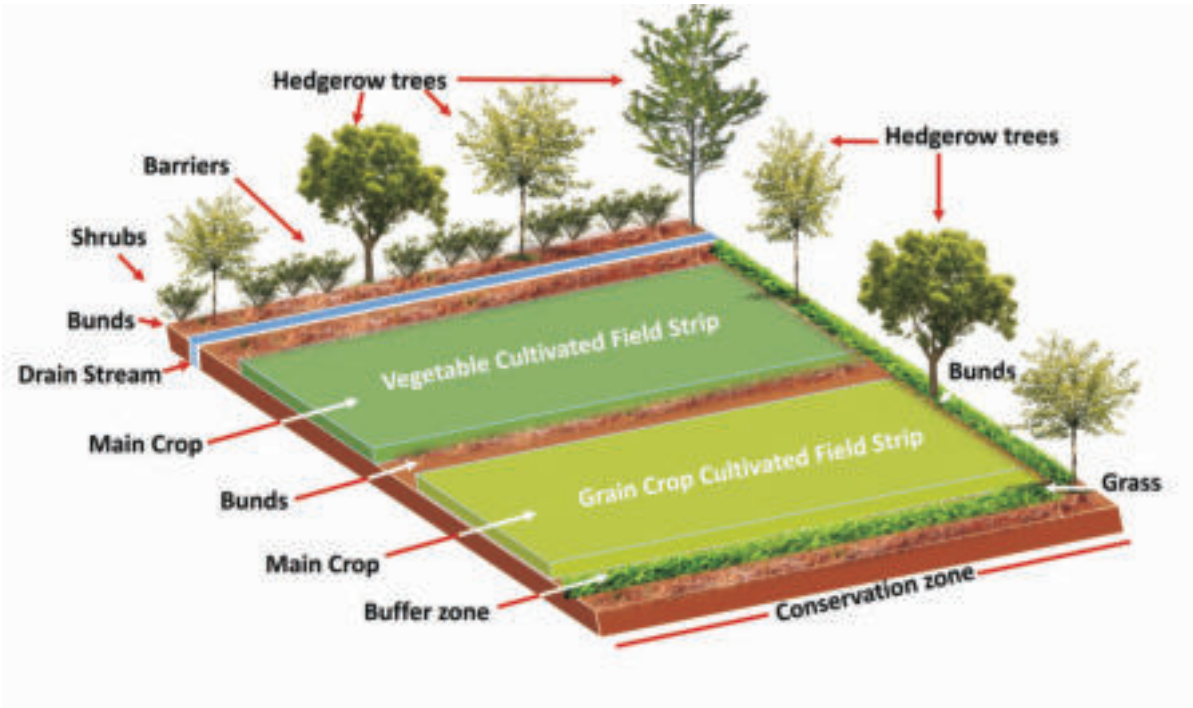
Source: Prof Dr Atul - Preparing, sketching 2D designs

This agroforestry system usually contains more than five tree species besides the main commodity crop or crops. Besides yielding products (fruit, timber, spices), the trees also serve as shade for companion crops and form multiple layers of canopy. Spacing between individual plants is usually irregular and management of the system is usually extensive. A further specification by experts classifies agroforestry systems according to the following criteria:

1) Structural basis , 2) Functional basis, 3) Socioeconomic basis and 4) Ecologic basis.

Agroforestry at landscape level

2.4. Figure 4: Agroforestry at landscape level having different components

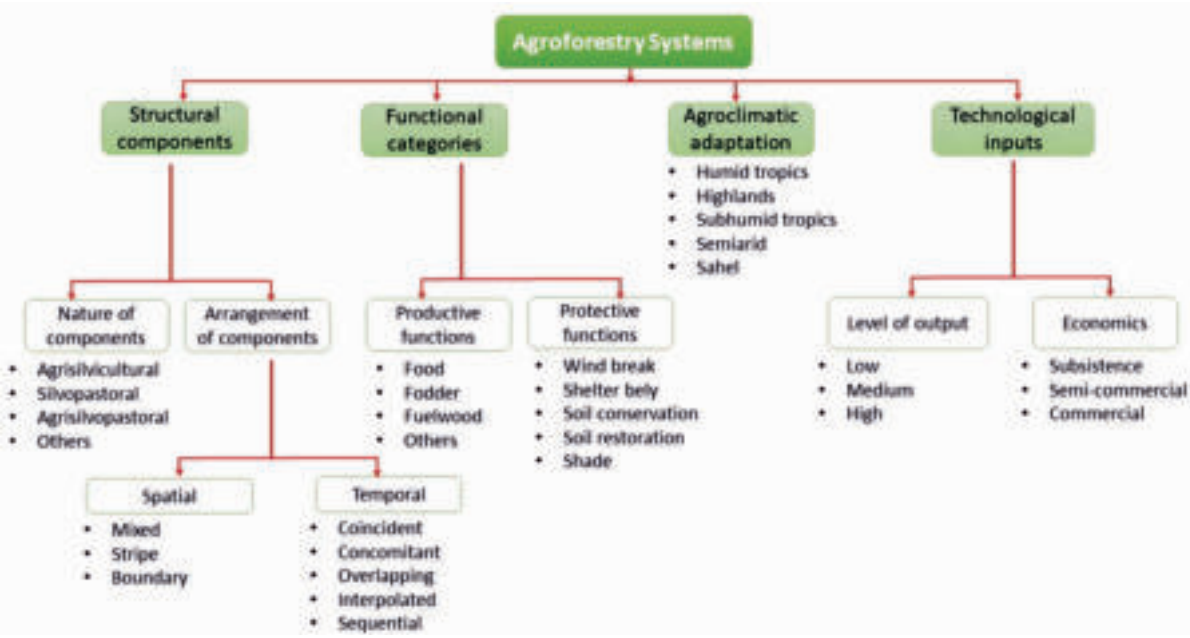


Source: Prof Dr Atul - Preparing, sketching 3D designs

Examples of agroforestry systems

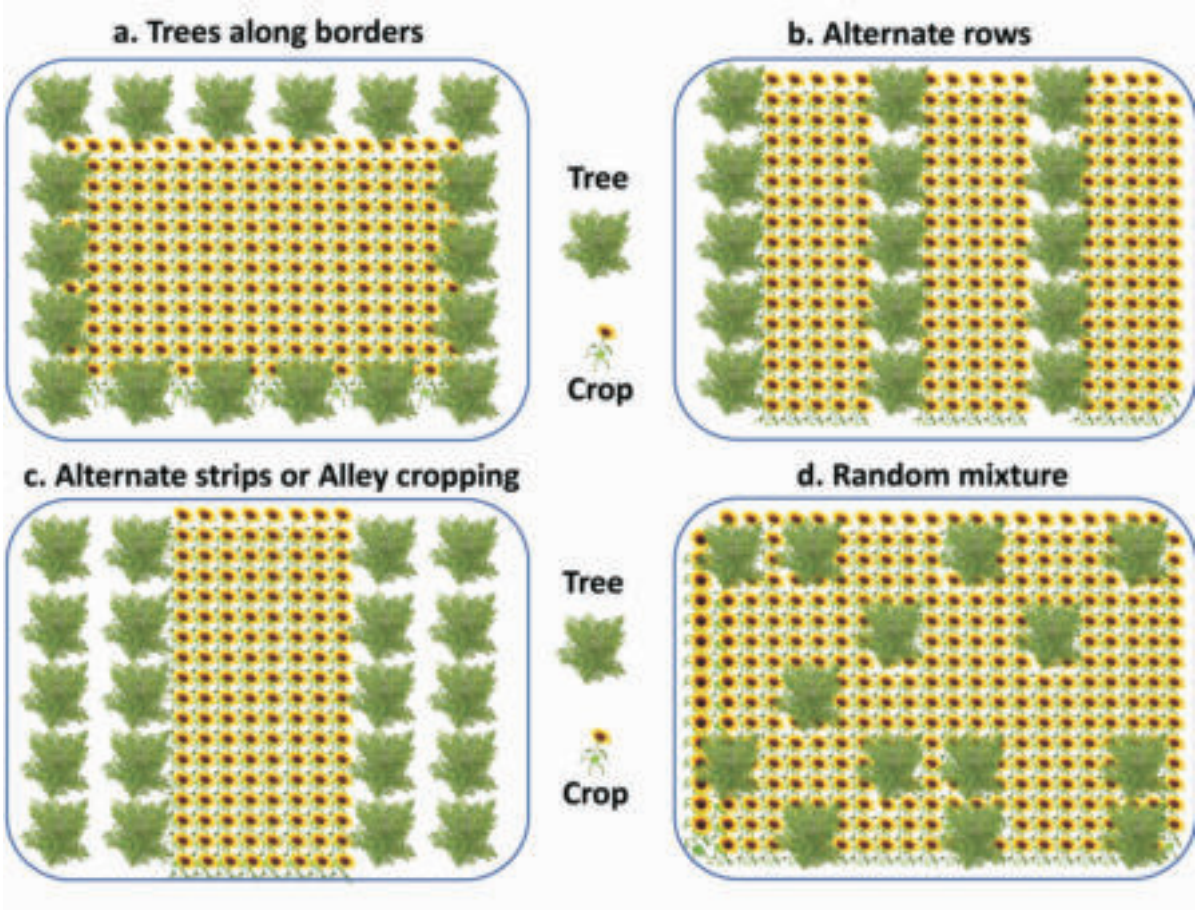
2.5. Figure 5: Agroforestry systems

- Agrisilviculture (Trees with crops),
- Silvi-pastoral (Trees with pasture and livestock) and
- Other systems (Trees with insects Trees with fishery) *etc.*



Source: Prof Dr Atul - Preparing, sketching 2D designs

2.6. Figure 6: Agrisilviculture System

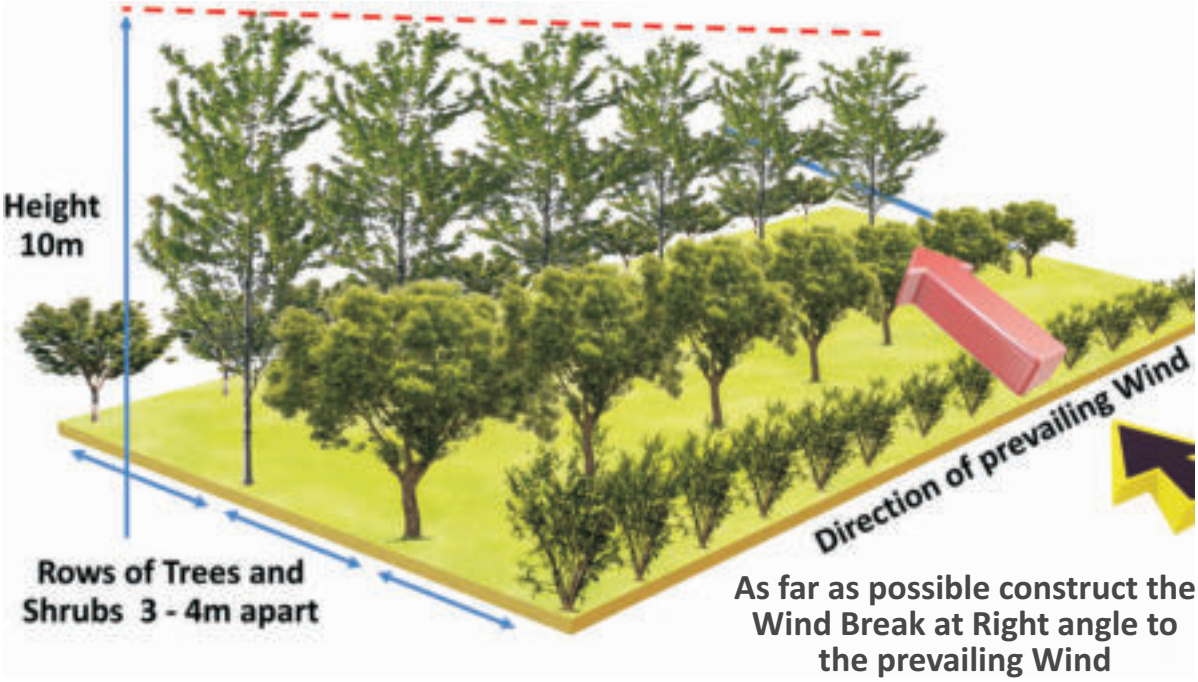


Source: Prof Dr Atul - Preparing, sketching 2D designs

2.7. Figure 7: Alley Cropping System

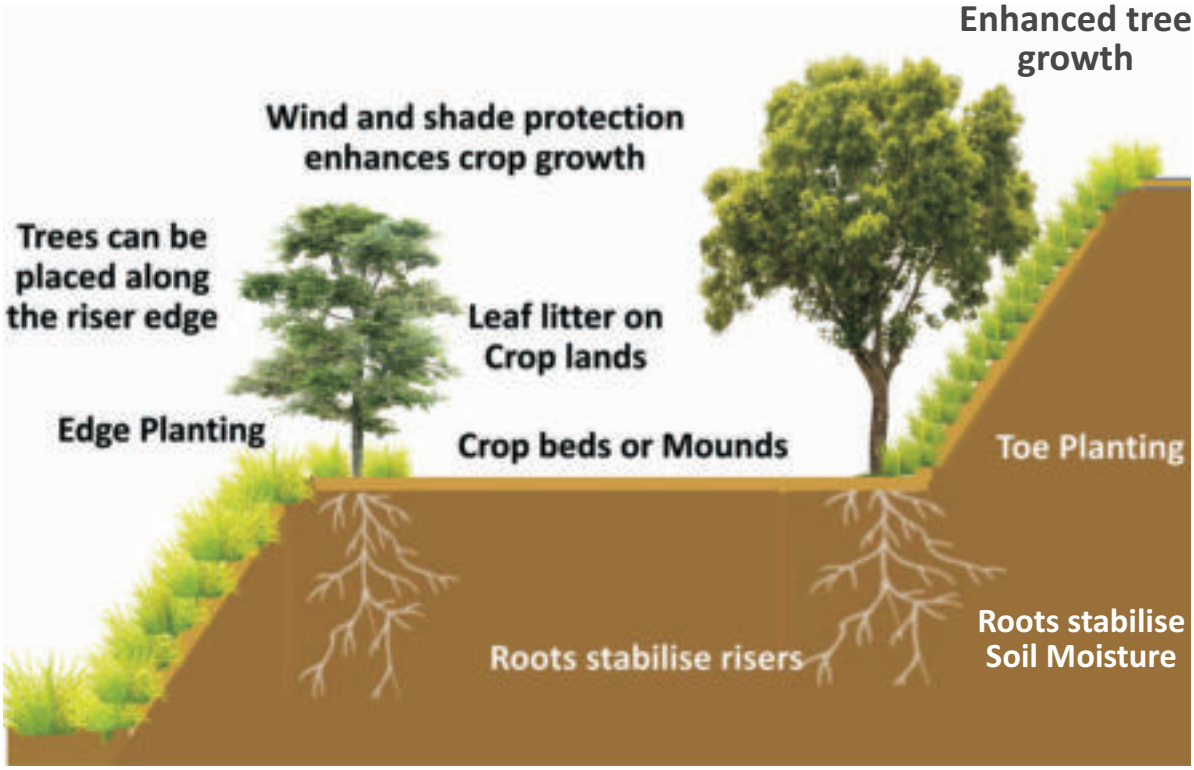
Source: Prof Dr Atul - Preparing, sketching 3D designs

2.8. Figure 8: Trees as Windbreaks



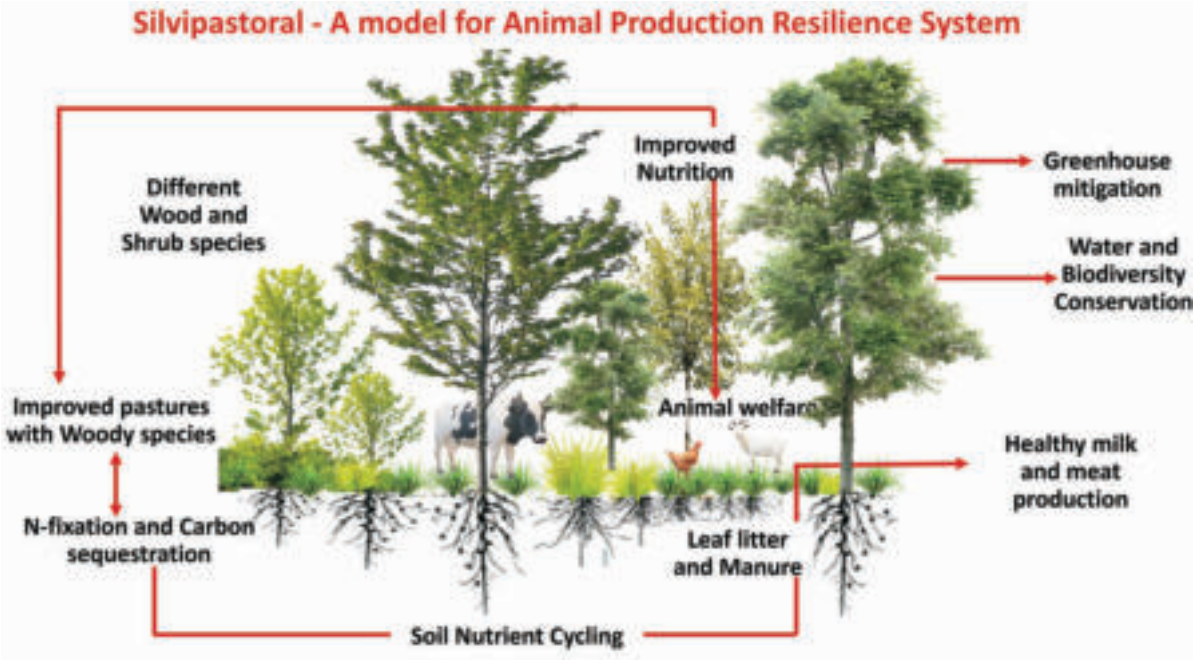
Source: Prof Dr Atul - Preparing, sketching 3D designs

2.9. Figure 9: Trees for Soil conservation system



Source: Prof Dr Atul - Preparing, sketching 2D designs

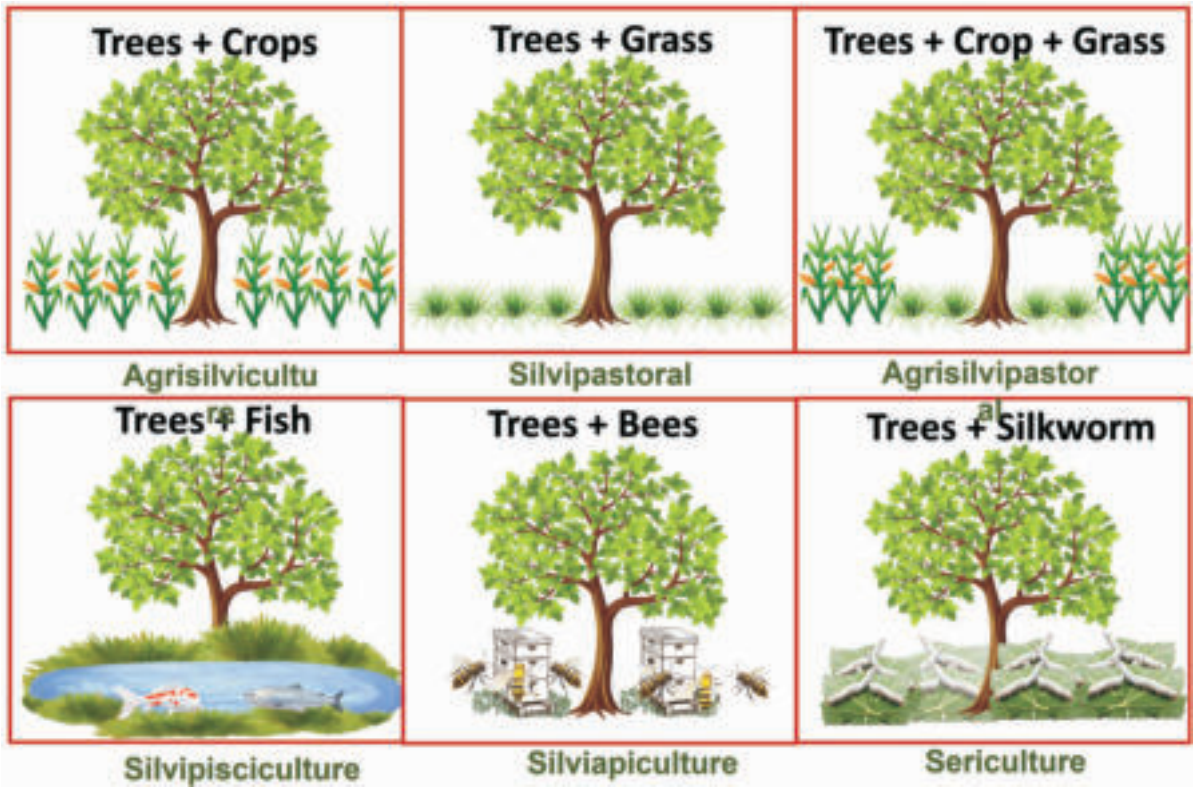
2.10. Figure 10: Silvi-pastoral System



Source: Prof Dr Atul - Preparing, sketching 2D designs

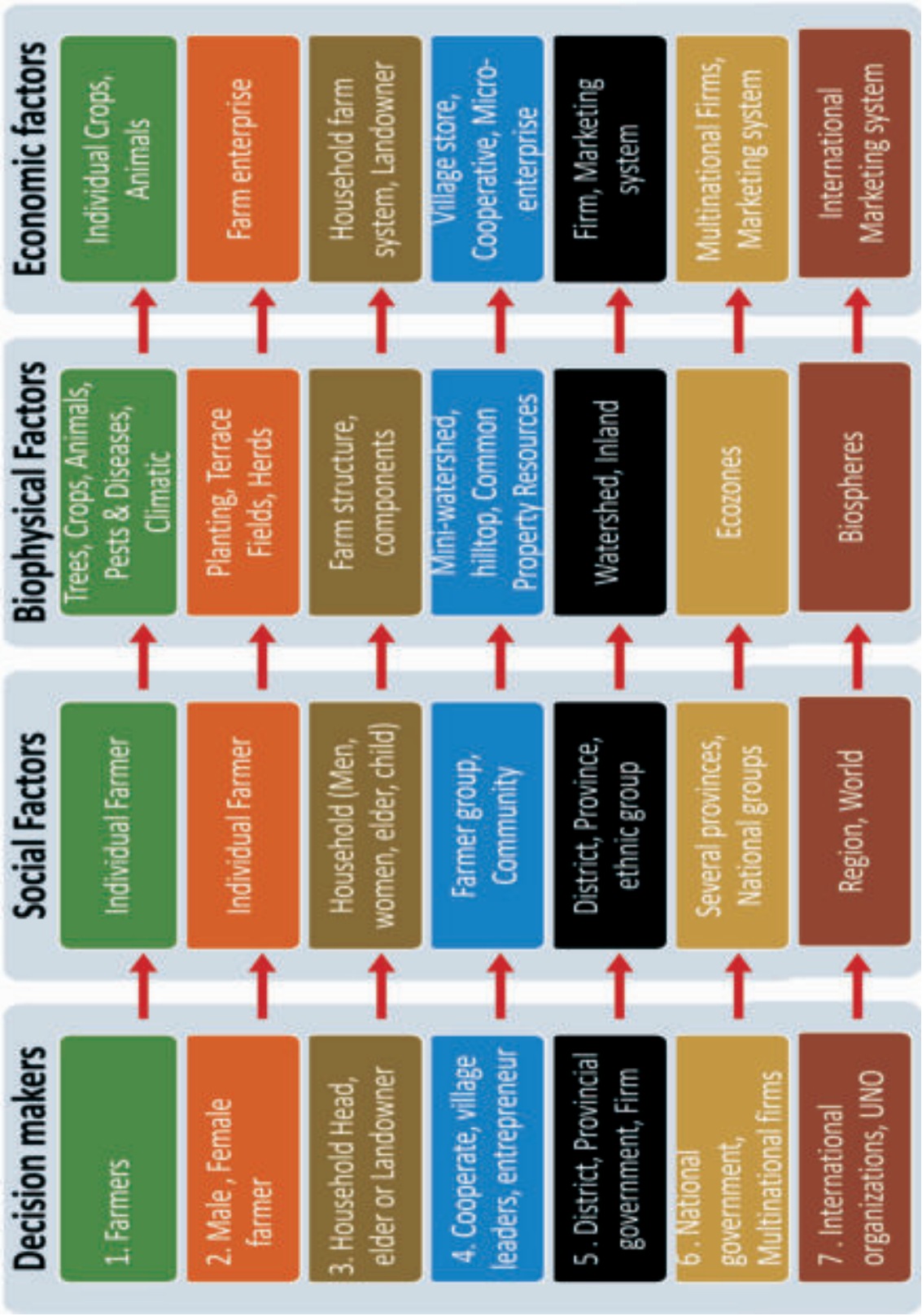
2.11. Figure 11: Other type of Agroforestry Systems

The information collected by all the 23 steps as given earlier by you will help to finalize the components and the priorities of the farmer, land, resources and skills to decide the design of the agroforestry system to be developed at the farm / landscape.



Source: Prof Dr Atul - Preparing, sketching 2D designs

2.12. Factors and the decision makers for adoption of various agroforestry systems are given below:



Source: Prof Dr Atul - Preparing, sketching 2D designs

The roles of agroforestry in a climate-resilient landscape

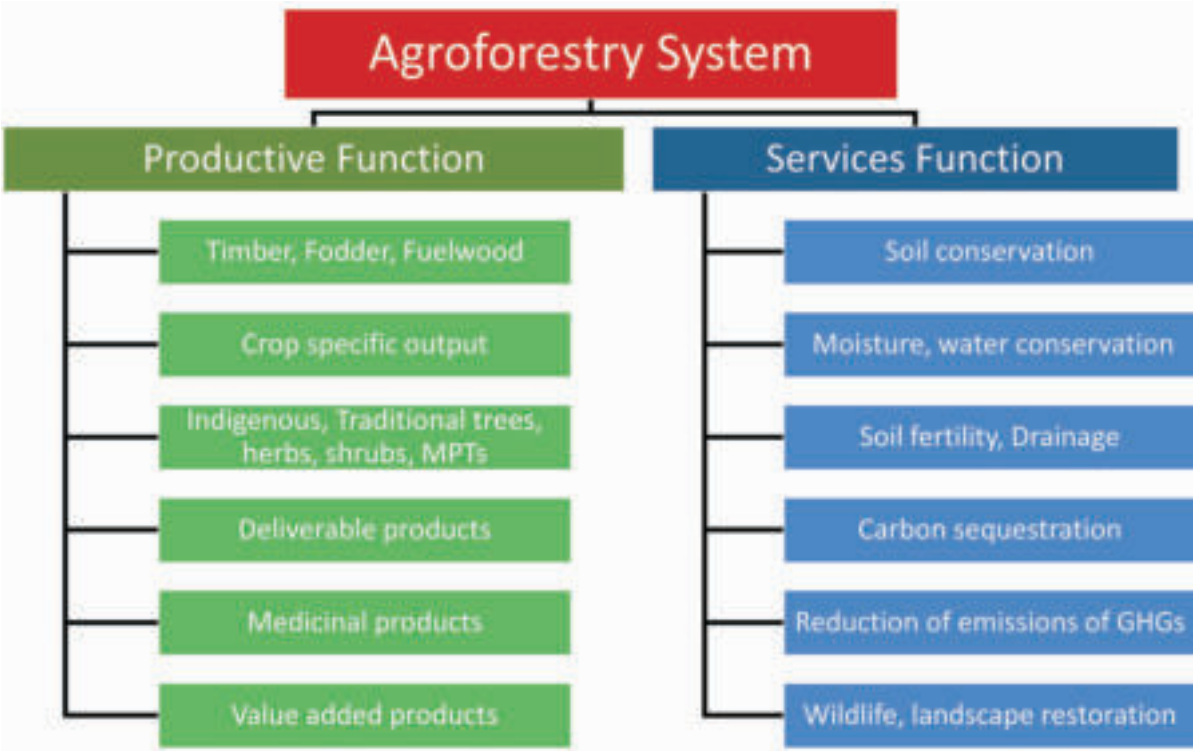
The role of agroforestry, through the integration of trees on farms and in landscapes, is to provide both products and services to achieve an improvement in livelihoods, the sustainable management of land and forests, and climate-change mitigation and adaptation. The providing of products and services are linked to the interests of all stakeholders, including smallholders, government agencies, the private sector, researchers and NGOs. The functions help landscape stakeholders increase their resilience to climate change.

2.13. Figure 13: Productive and service functions of Agroforestry

Productive functions

Agroforestry provides a range of commodities from a variety of trees and crops. Tree products include fuelwood, timber, fodder, fruit, gums, resins, thatching and medicines. Other products include:

▪ **Tree products:** Fuelwood, timber, fodder, fruit, gums, resins, thatching and medicines ▪ **Food:** Fruits, nuts, edible leaves and roots, honey ▪ **Tree commodities:** Confectionery, beverages, oils, industrial products ▪ **Energy:** Liquid biofuels, fuelwood, charcoal ▪ **Timber:** Sawn wood, veneer, plywood, poles ▪ **Medicines:** Herbal and other medicinal products ▪ **Fodder:** Animal nutrition supplements, dry-season feed



Source: Prof Dr Atul - Preparing, sketching 2D designs

Service functions

Agroforestry provides multiple environmental services at farm and landscape levels.

Control of runoff and soil erosion

Agroforestry practices reduce transport of non-point source pollutants, such as sediments or chemicals, to waterways. Trees help to improve water infiltration, reduce runoff volume, and clean polluted runoff and sediment.

Improved soil fertility

Incorporation of trees and crops that biologically fix nitrogen is common in tropical agroforestry systems. Non-N-fixing trees in agroforestry systems can also enhance the physical, chemical and biological properties of soil by adding above and belowground organic matter, and releasing and recycling nutrients.

Rehabilitated degraded land and mitigated land depletion

Degraded land can be regenerated and brought into production through regenerative agroforestry practices, with similar practices preventing further degradation and erosion.

Improved microclimates

Agroforestry microclimates provide protection for crops and livestock from direct sunlight, reduce wind speed and associated erosion, reduce temperature and increase humidity.

Source: Prof Dr Atul - Preparing, sketching 2D designs

Improved water infiltration

An appropriate selection of tree species and planting locations provides better management of water, with improved infiltration and flow regulation.

Conserved biodiversity

Agroforestry landscapes provide shade, migration corridors and habitats for mammals, birds, insects and other life forms. Agroforestry conserves biodiversity by reducing rates of conversion for natural habitats, providing corridors between habitats, and supporting other ecosystem services.

Sequestrated and stored carbon

Trees and shrubs in agroforestry systems sequester more carbon compared to monoculture crops or pasture. Agroforestry systems also store more carbon belowground.

Conserved spiritual and ritual values

Trees have symbolic, spiritual and ritual values in most cultures. Indigenous tree species are often part of identity and value systems, including religious and judicial traditions.

2.14. How to develop and design an agroforestry intervention?

An agroforestry intervention is a set of actions to implement concepts of agroforestry. The types of agroforestry interventions vary depending on the objectives

2.14.1 Examples of agroforestry interventions for different objectives

Specific objectives	Agroforestry intervention	Example of activities
Agroforestry for moderating microclimates of agricultural systems	• Appropriate shade trees moderate the effects of heat stress, particularly for heat-sensitive crops such as coffee, cacao, ginger • Appropriate shade trees provide windbreaks and shelter belts	• Select appropriate shade trees based on your objectives • Provide information on techniques for planting shade trees in agricultural landscapes • Promote the growing of shade trees
Agroforestry for soil and water conservation through provision of permanent cover	• Increased organic matter accumulation in the soil • Increased infiltration of rain water by growing more trees • Decreased runoff and erosion from growing cover crops and adopting contour hedgerows	• Select appropriate cover crops • Provide contour hedgerows • Introduce practices for managing land-use systems with permanent cover • Monitor soil and water quality regularly
Agroforestry for sustainable diversification of agricultural systems and incomes	• Increased farm income from agroforestry systems • Reduced risks of income instability • Identified new market opportunities and ways to expand existing markets • Diversified agroforestry products (not only production but also onfarm processing and other farmbased, income generating activities)	• Provide more information at all levels on markets for agroforestry products • Increase the adoption of multiple production activities that are complementary in economic and or ecological dimensions • Trees in agroforestry systems are significant sinks for carbon in agricultural land
Agroforestry for limiting carbon emissions and sequestering carbon	• Empirical evidence is collected to explain how agroforestry systems can reduce CO_2 • Actions for mitigating CO_2 emissions are promoted (including biofuel and bioenergy)	• Conservation of existing carbon pools through practices such as avoided deforestation and alternatives to slash and burn • Promote carbon sequestration through improved fallows and integration with trees • Substitution of biofuel and bioenergy plantations to replace fossil fuels

3. Young Farmer Entrepreneurship with Agroforestry Value Chain

Farmers as Entrepreneurs

Small-scale farmers all over the world have shown a remarkable ability to adapt. They look for better ways to organise their farms. They try new crops and cultivars, better animals and alternative technologies to increase productivity, diversify production, reduce risk – and to increase profits. They have become more market oriented and have learned to take calculated risks to open or create new markets for their products. Many small-scale farmers have many of the qualities of an entrepreneur to test those qualities following exercises need to be undertaken by all the trainees:

3.1. Exercise 1: Understanding background as a prospective farmer entrepreneur

The purpose of this exercise is to have you establish and your entry background regarding basic business best practices. This will assist you to organize and focus on setting personal goals for your business and for the subsequent training sessions. There are five key questions you need to ask yourself: What are the personal goals for my business? People become entrepreneurs for different reasons. These may be for income generation, having a unique idea, or by seeing other people do well in business. Think through your personal reasons and write down the reasons why you want to start a business. These reasons form the basis for your initiative and the driving force for your hard work. Later they will form a standard for measuring your success.

Why do I want to be an entrepreneur?

What are my ideas in tree business?

Businesses originate from generated ideas. The best business ideas have enough focus to translate the idea into reality and to begin its implementation. State your business idea in specific terms. You don't have to give the details at this point. For example, 'tree farming' is too general for a business idea. 'Establish nursery project to raise fruit tree seedlings for fruit farmers' is a specific idea. You may have many ideas. Write them down and evaluate which is most compatible with your skills, experience, resources and personal goals.

My business ideas

People start entrepreneurial ventures with different levels of experience, knowledge and skills. Some are trained; others have been previously employed in someone else's business or have run their own businesses, yet others have no prior training or experience. In either case everyone has questions about how to be a successful entrepreneur. Write down your questions about starting and succeeding in business. Highlight the ones you hope to address through this training. You may have some concerns which are not captured in this training. Discuss them with the trainers and other farmers you meet. Try as much as possible to find solutions to your questions so as to minimize any doubts as you progress with the training.

What do I want to know about business?

Do I have a habit of keeping records of how I use my income?

Recording incomes and expenses is a basic business practice. It is also the basis of business and personal budgeting. Reflect on your average income per week (especially the last week before the start of this training session), record all the money you received and spent. Begin with the cash money available to you in your home. Then enter your expenses for example, if you bought vegetables enter them in the column OUT

Date	Detail	IN	OUT	DESCRIPTION

How do I asses my progress in business skill acquisition?

During this training and as you begin the business; you will want to build your skills. These are same skills you will gain from the training session. Many more will be acquired with experience. This training is aimed at increasing your business skills, confidence and knowledge and certainly enhances your competency. There is a self-assessment tool as given in next exercise to help you evaluate your learning needs. It will help you identify weaknesses in your competency and show you what to concentrate on during the training and afterwards. Complete it at the beginning of the training and refer to it regularly to assess your progress and redirect your training efforts.

Understanding basic concepts of entrepreneurship

There are two processes involved in identifying business opportunities:

1. Description of the business opportunity

Who is the customer and what product or service are they buying? How do they use the product or service/Why do they purchase it? What do customers need that is currently not available? Is the need in the market growing? What changes are taking place that could affect purchasing choices? How did you get the idea? Why are you especially likely to succeed?

2. Business description

What is your product or service? Why is it unique? Who is your customer? Where will you sell your product or service? Why will customers purchase it? When will you be ready to sell it?

As a wise entrepreneur you need to start small. As you learn more about running the business as well as making money then you grow your business using profits. Depending on your business idea sometimes your own resources may not be enough at the start. You need funds for equipment purchases and operating expenses. The starting capital needed is determined from your business plan. If you decide to seek additional funds, you should be prepared with a business plan and know the alternative sources.

3.2. Exercise 2: Self-assessment on entrepreneurial qualities

Go through the statements below and score yourself to the best of your ability and as honestly as possible. Do not take too long thinking about any one answer, your first guess is probably the most accurate. Use the scoring key below.

Scoring: 5 – Always 4 – Often 3 – Sometimes 2 – Rarely 1 – Never

S.No.	Characteristic	1	2	3	4	5
1	I enjoy doing things on my own. Nobody has to motivate me to get started on a task.					
2	If I make up my mind to do something, I don't let anything stop me.					
3	I do not hesitate to undertake risks related to creating and operating an enterprise.					
4	I plan my time and resources well so I produce high quality products.					
5	I assess the time and capacity I have before I commit to accomplishing a job.					
6	I act upon the opportunities that needs and problems present.					
7	I keep trying again and again despite great challenges and failure.					
8	I work hard to try to foresee potential risks so as to prevent future risk.					
9	I make personal sacrifices to complete jobs in order to keep my word and meet promised deadlines.					
10	I always strive for improvement and progress despite feedback from people that they are satisfied with my work.					
11	Before undertaking my job I try to gain as much information about it as I can, and verify the accuracy of the information I am receiving.					
12	I set short and long-term goals for my personal life and business.					
13	I do everything I can to accomplish set business goals, through careful planning and implementation.					
14	I team up well with others for tasks which I cannot accomplish on my own.					
15	I am able to make decisions on my own, incorporating the suggestions and ideas of others as part of that process.					
16	I collect all the necessary information I need before I start a job or task.					
17	I set goals based on the resources and skills I have.					
18	I have the skills to persuade and communicate with people.					
19	I regularly evaluate my job performance, looking for areas of improvement.					
20	I am happy with my work and am confident that I will make progress and improvement in the future.					

Analysis of the result

Analysis one: Each statement is focused on different entrepreneurial qualities as stated below.

Question 1+ Question 6 = Opportunity-seeking Question 2+ Question 7 = Perseverance Question 3+ Question 8 = Risk-taking Question 4+ Question 10 = Demand for efficiency and quality Question 5+ Question 9 = Commitment to work contract Question 11+ Question 16 = Information-seeking Question 12+ Question 17 = Goal-setting Question 13+ Question 19 = Planning Question 14+ Question 18 = Persuasion & Networking Question 15+ Question 20 = Self Confidence

Now evaluate how you ranked yourself for that characteristic (based on your score for each of the questions). For example, if you rated yourself a "5" for both questions 1 and 6, then according to the key above, you have a strong opportunity seeking trait. If you rated yourself a "1" or a "2" for questions 14 and 18, then perhaps persuasion and networking are not among your strengths right now – and could be skills for you to work on. Analysis two: Add up your total score from all the numbers you wrote in each row.

Write your total sum here, and then interpret it below:

Total Sum = ...

Result Interpretation:

Score	Meaning
< 50:	Limited entrepreneurial qualities at the moment. It does not mean you are not meant to be a businessperson. It only means that you should spend more time preparing yourself to handle any problems you might face once you start a business.
Between 50 - 80	Average - there are gaps that need to be filled or improved upon. You might consider upgrading your knowledge or skills. Consider taking some courses.
>80	Good entrepreneur - keep it up and continue to develop.

3.3. Exercise 3: Entrepreneurship characteristics action plan

Based on your individual analysis of the self-assessment, please answer the questions below.

1. Identify three characteristics of an entrepreneur for which you scored the highest mark.

2. Identify three characteristics of an entrepreneur for which you scored the lowest mark.

3. Prepare an action plan which will help you to improve upon three characteristics of an entrepreneur for which you scored the lowest.

4. Working with a partner, either trade worksheets, or talk about your weakest characteristics and ideas for improvement. See if your partner has any further ideas for what you can do to improve on your weaknesses and then do the same for him/her.

The facilitator summarises the discussion and individual action plan based on the above information

3.4. Exercise 4: Tips to strengthen entrepreneurial skill

If you do not have enough of the qualities and abilities necessary to open/strengthen your own business, there are many ways to improve your business skills and alter your characteristics. You can;

Think about and learn how to deal with crises situations better? Talk to your family about the difficulties of running your own business and persuade them to support you. Become more open to new ideas and other people's views. When things go wrong, analyse what happened and improve your ability to learn from mistakes. Increase your commitment to work and realise that only hard work brings success. Talk to people in business so you can learn from them. Get some training, enrol in a course to study specific areas you need to improve in. Get work as an assistant/apprentice to a successful business person. Read books that will help you develop your business skills. Read articles about businesses in the newspaper and think about their problems and methods. You might want to think about finding a partner who complements your strengths and weakness, instead of going into business entirely on your own. Often people have not had much experience or practice in a business situation. If your number of weaknesses is high, go through the personal assessment exercise again and try and understand how the attitudes and characteristics described affect how a business is run. Try to develop the skills and attitudes described by applying them in your daily activities, for instance: Practice discussing the advantages and disadvantages of any situation or idea. Increase your motivation by making a plan for your future. Study successful business people and learn that your success depends mostly on your own efforts. Develop the ability to consider and assess a problem and take risks

Supplementary Activity

1. Identify an entrepreneur in your locality and indicate the qualities you have observed in him/her that make him/her a successful entrepreneur. Use the table below to record your observations.

Characteristic	How this characteristic is seen in the entrepreneur.
1	
2	
3	
4	
5	

2. Based on the analysis, the facilitator encourages participants to emulate the entrepreneur as a model.

3. Finally, the facilitator winds up the session by sharing tips for strengthening entrepreneurial skills.

Generating a business idea

3.5. Exercise 5: How to find out about some successful business ideas yourself?

1. Think of three businesses in your local area that you think are successful. Try to select businesses that are at least three years old. Write down in the space below the name of each business and the product or service they sell.

2. Go and talk to the three owners. See if they agree with you that business is a successful one. Ask them how they decided to go into that business and tick the same below:

Did they see a need in the market that was not being met?	Yes / No
Did they have some experience, contacts or skill to build upon?	Yes / No
Did they know someone else in the business?	Yes / No
Was this the first business they ever worked in?	Yes / No

Write in the space below any other questions you want to ask the owners

3. After you finish talking to the owners, complete a Business Idea Information Form for each business putting in as many details as possible.

4. Think about all the factors that have made the business idea a good one and why it has become successful business. Find answers to the following questions and write them in the form under "notes".

What lessons can you draw from the experience of the business owner?
What mistakes do you think the owner made?
How can you avoid the same mistakes?
What do you think has made the business a success?

3.6. Exercise 6: Business Ideas Information Form

1.	Name of the business.
2.	Products or services sold.
3.	Main customers
4.	When and why did the owner decide to start this business?
5.	Why did the owner think it was a good idea to start that particular kind of business?
6.	How did the owner find out what local people wanted?
7.	What strengths or assets did the owner use to start this business? (*e.g.*, previous experience , training, family background, contacts, hobbies)
8.	What problems did the owner face in setting up the business?
9.	Has the product or service changed over time?

3.6.1. Generate Your Own Business Ideas

Maybe you do already have a business idea? This is a good sign. It shows that you are committed to starting a business and you have already started the work of "thinking". But you should be careful not to hold on too tightly to your first idea. There are many opportunities and the first idea can lead to an even better idea. When generating a business idea, it is best to try and keep an open mind. The first goal should be to think of as many ideas as possible and make a list of all the business opportunities you can think of. Business ideas can be generated through:

- Using experiences
- Visits to your local business area
- Investigating your environment
- Brainstorming

3.6.2. An "Idea" List

Begin an ideas list for your own business. Go back over the various activities you have done so far, select any ideas that might be suitable for you and write them down in the activity box below. In this list, jot down ideas you will generate as you carry out other exercises to generate business ideas, here is an example

Ideas list for my own business	
Ideas	Description
A catering service delivering lunches to office	I know about and enjoy cooking. No one else does this in town. There will be lots of customers. I can find out what they want and know how much money is needed to start. It will probably be tiring with many deliveries to make. I would enjoy meeting so many people.

3.6.3. Analyse Your Business Ideas and Select the Best One

3.6.3.1. Screen your ideas list

By now you probably have quite a few possible ideas for your own business - at least five or perhaps over twenty. Your next task is to take this list and try to bring it down to between three and six ideas- the ones that are most

suitable for you. You can select the most suitable ideas from your list by thinking carefully about each idea. There is probably still a lot you don't know about the business on the list but the questions below will help you settle on one feasible idea. Go through your list of business ideas and make notes about each by answering these questions:

Which	
Which customer needs do you want to satisfy?	
Which customer needs will your product or service satisfy?	
What	
What product or service do your customers want?	
What quality of the product do your customers want?	
What do you know about the product or service for this business?	
Who	
Who are your likely customers for this particular business?	
Will they be enough in number to keep your business viable?	
Who are your competitors?	
How	
How will you be able to supply goods and services the customers want?	
How much do you know about the quality of goods and services the customers want?	
How does running this sort of business suit your personal characteristics and abilities?	
How do you know there is need for this business in your area?	
How do you imagine yourself running this business in ten years' time?	
Other Important Areas to Consider	
Where can you get advice and information about this business?	
Will this be the only business of this kind in your area?	
If there are other similar businesses, how will you be able to compete successfully?	
Why do you think this business will be viable?	
Does this business need equipment, premises or qualified staff? Do you think you will be able to get the finances to provide what is needed?	
Where will you get the resources to start this business?	

3.7. Exercise 7: How to conduct the SWOT Analysis?

One method people often use to decide which the most suitable business idea is the SWOT analysis. It helps you focus on possible problem areas and potential advantages of each idea. S-trengths W-eaknesses O-pportunities T-hreats.

Now that you have your ideas, look at the examples for business ideas below to see if some of them are here

Idea		Yes / No
1.	Grain utilisation : o Fried and packed g/nuts, soya seeds, maize, simsim o Peanut butter	
2.	Wood work o Ropes/strings o Bags/sacks o Belts o Wall decoration o Floor, car carpets o Table ware o Furniture, bed covers o Nets	
3.	Milk from cattle, goats and sheep o Ghee o Butter o Yoghurt o Milk-packing	
4.	Fish o Fish ponds o Fish drying o Fish feeds making and packing o Piggery, poultry feeds making	
5.	Honey o Honey processing o Wax making	
6.	Wood o Furniture o House fittings o Body building (*e.g.* lorries, boats, wheelbarrows, shelters) o Toys and carvings o Matchsticks	
7.	Fruit processing o Fruit juice o Fruit jam o Tinned fruits o Solar dried fruits	
8.	Potato utilisation o Chips processing and packing o Crisps	
9.	Meat processing o Meat balls, burgers o Sausages o Samosas o Meat pies	
10.	From the service sector o Motor vehicle repair o Electrical repairs (TVs, radios, flat irons, *etc.*) o Motorcycle transport o Retail shop, grocery o Market vendor o Photocopying machine o Laundry and dry-cleaning o Secretarial services o Stationary store o Book store o Cafeteria/restaurant	
	Specify if any other	

When we have a business, we often take it for granted. 'We have always done it this way'. But is it the best way? We need to look at our business often as if it belongs to someone else. Be critical. What could we do that would raise our profit? What do we do well? Where do we need to improve? What could we do to attract more customers? Do people like to do business with us? Do we run it in a business- like way?

We need to do a SWOT analysis every three or four months, to see if we can improve our profits. A SWOT analysis lets you look at your business on a regular basis and work to improve your weaknesses and make the most of your opportunities. Strengths and weaknesses are in your control. You can do something about them. Opportunities and threats are outside of your control. You can still respond to them.

Assume you run an animal feed shop.

You have decided you need to look at how you run the business, to see if it's as good as you can make it. You start by making a list and you write down everything you can think of about your business. You animal feeds to your friends at half price. A new ranch is being established near the town centre. You record your sales in the cashbook every day. Some of your feeds are poor quality. You're always friendly with your customers. Three new animal feeds shops are opening in town. The shop nearest to you is opening an hour early. You have not paid your business license this quarter. You visited three farms near the town and have some new orders. The Council is talking about closing your street to commercial business.

Look at the list and decide which things listed are **strengths**. 1. Keeping daily records is very good. 2. Being friendly with your customers is good. People would much rather buy from someone who is pleasant and greeted them by name than from a bad tempered person. 3. Visiting the three farms to get some orders was a good thing to do. You went out and looked for business.

What are the **weaknesses**? 1. Selling feeds to your friends at half price reduces your profit, so that is bad… a weakness 2. Also, why would anyone buy poor quality feeds? In business, you want a reputation for selling a quality product for a fair price. Bad quality is a weakness 3. There is no excuse for not paying your business license.

Now let's look at the **opportunities**. 1. The new ranch is being established near the town presents you with an Opportunity. They will be buying animal feeds for their animals and maybe, you can persuade them to buy from your shop.

Lastly, let us look at the **threats**. 1. The new shops are a threat… they are competition. However, if they pay their business license you cannot stop them coming. 2. But what could you do about the shop, which is opening earlier than you do? You might also arrive early. 3. If you hear rumours that the Council is considering closing a street to your shop, you may not be able to do anything to stop them, but you can be looking for another favourable location.

3.7.1. Sales Forecast

Why is it important to forecast sales revenue?

Sales forecast is done at the beginning stages of business as part of the market strategy. It is very important at the early stages because it is a test of the viability of your business idea. Later the sales forecast will be used as a tool (Appendix IV) to evaluate expenses to ensure the business returns a profit. As an entrepreneur you should review your sales forecast regularly in assessment of your business situation as well as to plan for the future.

It is important to understand your sales revenue. This is what you receive when you sell your product or service. For example if you are selling tree seedling at Rupees. 50 each and you sell 1000 seedlings then your sales revenue is 1000 x 50 = 50,000

Sales Revenue = Quantity Sold x Price per Unit

Note: Revenue is not the same as profit.

Revenue refers to the income without subtracting expenses while profit is income minus expenses. To forecast sales revenue, you need to identify: Your customers Their buying pattern Price per unit

Your Customers

Developing A Business Plan

3.8. Exercise 8: Preparing a checklist for business plan

Think about the following issues (not an exhaustive list).

•	The product	
	Why would customers buy the product/service?	
	Are the product specifications clear and acceptable?	
•	The market	
	Geographical description of the business location	
	Is there local demand for the product and if not, how can it be created?	
	Who are the big competitors, how can you counteract them and their influence?	
	How many competitors does the business have?	
	If they are many, your market share is low, which means that aggressive promotion is necessary to ensure visibility.	
	Does your product need publicity and if so, what expenses would that incur?	
	What is the trend in the selling price? Is there any seasonality?	
•	Technical factors	
	Have you selected all the necessary equipment?	
	What are your reasons for this selection?	
	If you buy machinery, check if you have a guarantee and if after sales service is included.	
	Do you know where to source the equipment from?	
	Who is the supplier?	
	Do you have the necessary skills and if not, where can you get them?	
•	Infrastructure	
	Is the working/selling space adequate for your business operation to function?	
	Are ownership/tenancy documents for the land/shop/workshop in order?	
	If water is required for your business to operate, is it available close by?	
	Do you have/need a supply of electricity?	
	Is transport of raw materials or finished goods a critical factor and if so, how do you plan to handle it while minimising costs?	
	Do you need to register your business? What are the legal requirements?	
•	Financial analysis	
	Have you done financial calculations of needed costs, resources, income etc?	
	Have all the costs of production been included in your calculations?	
	Does the business generate enough cash from the beginning so as to meet immediate liabilities (*e.g.* rent, loan repayment).	
	Check your cash flow projections. Are they realistic?	
	Check all estimates of capital required as well as running costs.	

3.8.1. Market Analysis

Learning objectives: The participants will be able to Define market research. Know how to identify their likely competitors Know how to identify the likely demand from customers.

3.8.2. Market research

3.8.2.1. How to do market research?

1) Talk to potential customers. Ask them, for example: What products or services they want to buy? What do they currently buy? Where do they buy? Why do they buy from XY? When do they buy? How much do they buy? Which price do they pay? What are their preferences? Do they get any extras? What do they think about your competitors?

2) Study your competitors' businesses. Find about: Their products or services, for example quality and design What prices they charge What exactly do they sell? How does their product differ from yours? Where do they get their inputs? Where do they sell? How do they promote their product/service? Do they have any special approaches to customer care? How can you compete?

Important note: Be very careful to carry out your research in a friendly, sensitive way; ask questions and also observe – be aware: nobody likes more competition!

3) Ask suppliers and business friends Which goods sell in their business What they think about your business idea What they think about your competitor's product

Go out into town with your small group, and find a business that most closely matches the "best business" that you identified earlier. Find out if the owner/manager, or an employee has some time to answer some questions for you. Try to gather as much information as you can, based on the categories/potential questions below. If there is time in the two hours that you are out in the field, do the same with a second business, so that you can compare answers. Record what you find out in the middle column. The column on the right is for your own comments, analysis, suggestions, reactions, *etc.* Remember to be respectful of the person's time – he/she has a business to run – and only take as much time as he/she wants to give. Also, keep in mind that there are some questions that the person may not feel comfortable answering, so be respectful of that as well.

3.9. Exercise 9: Checklist for Categories of information for market survey

Category/Question to be asked	Information gathered during survey	Further Questions/ Comments
Who are customers		
Working place and costing		
Cost of owning or leasing premises		
Availability, supply and cost of raw materials		
Availability of staff		
Cost of working tools and equipment		
Competitors analysis		
Advertising Methods		
Tax issues and legislation		
Challenges		

3.10. Exercise 10: Financial Analysis

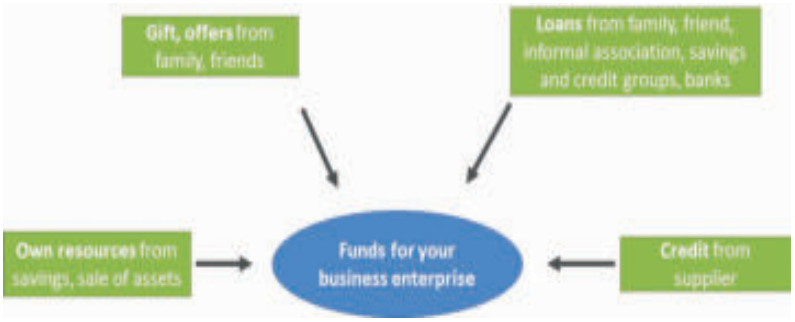
A simple format for a budget

Activity	Amount in (Currency)
Income (money in)	
Total Income (money in)	
Expenditure (money out)	
Total Expenses (money out)	
Savings	
= + Surplus/-Deficit (Money In - Money Out	

Resource mobilisation

Figure 3.1: The Framework of resource mobilization

The three elements of the framework are 'resources', 'mechanisms' and 'resource providers' can be given below.



Source: Prof Dr Atul - Preparing, sketching 2D designs

The above sources however have both advantages and disadvantages as shown below.

	Advantages	Disadvantages
Own resources	• Own decision • Own planning & timing • Full control and benefits • No extra costs (interest)	• Self-reliance motivating • Capacity of individuals limited • Danger of relaxation in business management • No sharing of risks
Gifts, offers	• Free • No extra costs involved	• Not reliable • Not timely • May be tied to other person's agenda, wishes
Loans	• Extra resources • Enforces discipline • Induces external control	• Interest charges • Not timely • Tight repayment regime • External control of ones business • Risk of loss of ones other assets in case of failure
Credit (esp. from supplier)	• Sure way of obtaining supplies • No interest charges • Reduction in operating expenses	• High prices • Inferior supplies • Inflexibility in planning supplies • Dependency on supplier
Grants (public or private)	• Free • Higher amount	• Consider specific levels (local, regional, national, international), sectors (*e.g.* health, agriculture, politics) and target groups (*e.g.* youth, orphans, women) • Strict rules for application and accountability • High competition

3.10.1. Loans

These are some of the possible requirements when applying for a loan:

A thorough business plan with a business idea that the lending institution believes in. Some kind of collateral may be required. Collateral means security that the lending institution has for the repayment of your loan. This may be your business if you own one, your home, machinery and any other equipment. Being an account holder or member of a bank, credit institution or association and having operated an account successfully for some time Having a certain percentage (part) of the total loan as security in your account Information on yourself/yourselves and your ability to repay the loan Having a minimum age (mostly 18 or above) Referees, guarantors (honest people with a good reputation).

When is it useful to get a loan?

When there is a justifiable financing gap in your business funding plans When other options such as saving and group-financing are not possible when there is the need to take up an urgent opportunity that could lead to quick profit.

Where can you borrow?

Banks and financial institutions Societies and associations Friends, relatives, family members Suppliers Government Savings and Credit Cooperatives.

3.10.2. Types of loans

Group loans Loans with formal banking institutions (such as SACCOs) Individual loans Loans with informal savings groups and associations.

Before one borrows money, they should consider these factors seriously.

Develop a solid business plan including total funding requirements and running costs for the first few months. Develop a financing plan including identifying funding sources Identify and approach financial institutions in your area Obtain the terms and conditions for the loan to be availed Compare them with those of other financial institutions around Check your business plan to establish the implications of such a loan (monthly repayment and interest rates will affect your income/profits). Check if your business can cope with these implications Initiate further discussions with the financial institution or association.

Realistic Planning

3.11 Exercise 11: Contents of a Business Plan

1.	General description of business	
	• Name of business, business location and address	
	• Nature of business activity	
	• Type of business organisation (partnership, cooperative, new, old,)	
	• Any further explanation summarising why the business will be successful	
2.	Personal background	
	• Name of business owner(s), promoter(s)	
	• Educational, professional background	
	• Relevant experience in business-related activities	
3.	Market plan	
	• Business market area and targeted customers/ customer groups o Why you will be able to compete with existing products/ services and how do you compare competitors (price, quality, appearance, performance,)	
	• Past, current, future (projected) market demand for your product/service (if possible in terms of volume/units per day/months)	
	• Suppliers and supply terms and conditions	
	• Unit pricing and list of all items/services being offered	
	• How you will be selling your produce (direct, dealers)	
	• Tip: Include the market research survey report as an annex	
4.	Business management plan	
	• Who will be the actors in this business	
	• Specify their roles and the division of labour (if applicable)	
	• How will the business work be organised (*e.g.* working shifts, working times, working conditions)	
5.	Financial plan Investments required	
	• Fixed assets/starting equipment (*e.g.* land, tools, machinery)	
	• Preliminary expenses o Pre-operative expenses (*e.g.* legal fees, licensing fees, bank charges,) o Start-up expenses (*e.g.* water, electricity connection, cleaning of premises, *etc.*)	
	• Working capital (raw materials, rent, water, transport, *etc.*)	
6.	Sources of raising funds	
	• Total requirements	
	• Own contributions/investments	
	• Family/friends contributions	
	• Already secured loans, credits etc	
	• Total funds available	
	• Deficit/funding gap	
	• Loan support required	
7.	Operating plan forecast	
	• Projected operating income statement o Income from sales	
	• Less cost of production and overhead/fixed costs	
	Net profit	
	• Break even analysis	
	• Cash flow projection	
8.	Major assumptions	
	Give the assumptions you've made that underpin your plan *e.g.* assumptions that particular resources will be available	
9.	Business profile	
	Summary that shows all major aspects on one page	

3.12. Exercise 12: Business Plan Template

A business plan is a document that describes your business details and giving goals and objectives and lists the steps you will undertake

3.12.1. Sections of Your Business Plan

A. Cover page B. Table of contents C. Executive Summary D. Statement of Purpose E. Business Description F. Organisation and Management G. Production Plan/Operational H. Risk Reduction I. Financial Pla

3.12.1.1. A. Cover Page

i. Business Name	
ii. Business Address	
iii. Name of Presenter	
iv. Organisation presented to	
v. Date of presentation	

3.12.1.2. B. Table of Contents

Give numbers of various key sections of your business plan

3.12.1.3. C. Executive Summary

Give brief overview of your business highlighting the key features. What is the business about, products/services on offer, market-main customers, human resource The organisation's structure, financial summary-projected income and assets among others.

3.12.1.4. D. Statement of Purpose

Outline the purpose of the business plan

3.12.1.5. E. Business Description

i. Business Location address ii. Business Ownership (nature of the business) iii. Products/Services offered iv. Industry which the business will operate under v. Justification of the business vi. Short term and long term goals vii. Entry and growth

3.12.1.5. F. Marketing Plan

Highlight how your plan to market your products/service *i.e.* how do you intend to reach your target? i. Outline the characteristics of the potential customers ii. Competition - Who are the main competitors? - What are their strengths? - What are their weaknesses? - How do you intend to capitalise on their weaknesses? iii. Market share - expected total market share iv. Pricing strategy; outline your pricing strategy v. Advertising and promotion; outline your pricing and promotion strategy - Initial plan - Long term strategy - Distribution strategy - Sales tactics; outline your sales tactics

3.12.1.7. G. Organisation and Management

i Organisation structure (draw your organisational chart) ii. Management team State the composition of your management team, its qualification/post, duties and responsibilities - Other personnel (What other employees will you require?) - Outline how you will recruit and train your staff iii. Remuneration of staff Highlight how you will recruit, train and develop your staff iv. Remuneration/incentives (How will you remunerate them?) - Salaries/wages - Fringe benefits v. List the support services required vi. Licenses/permits - Required licenses/permits - Who will provide the licenses /permits and at what cost

3.12.1.8. H. Operational / Procedural Plan

Describe briefly how you will operate your business i. Production facilities and capacity utilisation ii, List the machines, equipment and tools required - Describe the cost, capacity and supplier of required machines and equipment iii. Production strategy - Outline the materials requirement - What is the material cost - Outline the source iv. Production design development - Outline how you will design and develop your product - What will it cost to design and develop your products? - Outline the estimated cost of product/service Direct Material cost+ Direct labour cost+Overheads v. Relevant regulation - List the patents and regulations needed - What is the cost of obtaining the patent trademarks? - List other legal rights will seek

3.12.2. Risk Reduction Strategies

i. Outline how you will analyse and reduce business risk

ii. Future business risks

3.12.3. Financial Plan

Identify how you will obtain and use business finance i. Pre-operational costs a. Outline your pre-operational cost b. What is our proposed capitalisation capital? - Own contribution (your capital) - Funds from borrowing sources -

Total investments ii. Identify the working capital requirements a) Prepare your income statement (Template A) b) Prepare your balance sheet (Template B) c) Prepare your projected cash flow statement (Template C) d) Outline how you expect to finance your operations e) Outline your initial capitalisation for existing business f) What is your proposed capitalisation? g) What is your break-even level? h) How do you measure your profitability?

Marketing

What is marketing?

Who are your customers?

Your customers are the people or other businesses that want your products/ services and are willing to pay for them. They include; People who are buying from you now. People you hope will buy from you in the future. People who stopped buying from you but you hope to get them back.

What are my customer's needs and wants?

An Important point to note is that customers want to look at different products so that they can choose what they like best. Some customers want a different design and others want high quality and are willing to pay extra for that.

How can I satisfy my customers'?

You need to do everything to find out who your customers are and what they need and want in order to satisfy them improve your sales and make a profit. You need to find out; Products/services your customers want. Price your customers are willing to pay. Location of your business in-order to reach your customers (Place). Promotion to use to inform your customers and attract them to buy your products or services.

The 4 P'S of Marketing

3.13. Exercise 13: Market simulation activity

Objective(s) of activity:

Participant will get to experience marketing through a live simulation.

At the end of the activity participants will be able to; experience the interplay of factors influencing the market such as price, product, place and promotion realise the difficulties new entrepreneurs have when entering the market place observe the impact of different marketing strategies on the capturing of market share

Materials/Handouts needed: Materials found in the classroom *e.g.* pens, mobile phones, bag, shoes *etc.* Pen Paper

Instructions:

1. Divide participants into buyers and sellers.
2. In the first round, four sellers set up shops in demarcated areas of the training room and sell their allocated products to the buyers at a set selling price.
3. The buyers are divided into high, middle and low-income groups. Each income group is given a limit on how much it can spend to purchase products.

Reflection questions:

What are your thoughts on your experience of the exercise? What have you learnt about marketing and competition analysis during the exercise? What lessons can you apply in your business today?

Extension/ Simplification options:

1. One of the, buyers in this round is an entrepreneur who wants to start a business.
2. In the second round, he/she (entrepreneur) uses the opportunity to study the competition and potential customers and develop a marketing strategy that will ensure a profitable market share is captured.
3. In the second round the fifth seller enters the market and applies his/her marketing strategy.
4. The second round is less restrictive than the first round as selling prices, demarcated areas and products are not allocated to sellers. The fifth seller's success depends on the strategy applied, his/her selling ability and how the other competitors respond to their market shares being encroached upon. The role of the fifth seller is similar to that of the participants, after the training, as they are new entrepreneurs about to enter an existing market.

3.13.1. The Marketing Process

Market research: is the gathering of information that ties a small enterprise to its customers. It provides the information that is necessary for companies to correctly position their product in the marketplace and offer the best combination of product, price, place/distribution, promotion, and person. Well-designed market research gives a person an edge on their competition, reduces their risk, and improves the effectiveness of their enterprise activities. Quality market research is the key to success for the small entrepreneur. If a person does not understand their customer and their needs they will likely fail in their enterprise.

3.13.2. Why Conduct Market Research?

To develop product, price, promotion, place/distribution, and people plans. To identify problems in their marketplace and discover new opportunities. To learn about competitors and how they are marketing their products. To find out what consumers think about their product category. To gauge the performance of existing products

Market research involves the organised, objective collection and analysis of the above data. It is often conducted as the first step in identifying the feasibility of an enterprise idea. It always incorporates some form of data collection and is either secondary research (often referred to as desk research) or primary research (direct from an individual).

3.13.3. How to conduct market research?

Talk to potential competitors to find out;

• Their products or services (for example quality and design)	
• What prices they charge	
• What exactly they sell	
• How their product/services differ from yours	
• Where they get their inputs?	
• Where they sell?	
• How they promote their product/service	
• Any special approaches to customer care	
• How you can compete.	

Important note: Be very careful to do research in a friendly, sensitive way; ask questions but also observe, be aware: nobody likes more competition!

Ask suppliers and enterprise friends. Which goods sell in their enterprise. What they think about your enterprise idea.

3.14. Exercise 14: Example of a marketing action plan:

S.No.	Target Customers	Products to be sold/ supplied	Their preference need for the product (*e.g.* quality, colour, size)	Mode of delivering	Target sales per month or week
1					
2					
3					
4					

3.14.1. Costing and Pricing

Why is it important to determine the cost of goods/services/offered by an enterprise? Let's pick an example of a woman selling tomatoes.

Daily Sales*	Currency (Rs.)
20 kg tomatoes @ Ksh. 15 per kg.	300
Daily Expenses	
Cost of tomatoes: 24 kg @ Ksh 10 per kg.	24000
Transport	20
Market fee	10
Total expenses	2700
Profit	30

3.15. Exercise 15: Calculating the cost of the tomatoes per kg

What determines the cost per kg, apart from the purchase price of tomatoes, the level of wastage and the expenses? Suppose only 10 kg of tomatoes are sold every day. What will be the cost of one kg of tomatoes? Let's go back to the original figures for the tomato vendor but without the quantity sold and sales figure. Imagine that this is an estimate of costs and selling prices for a proposed new micro-enterprise. You are asked to advise on whether this tomatoselling business is feasible. You have to help this woman to work out what would be the minimum level of sales necessary to cover her costs and earn the wage which was earlier agreed to be reasonable.

3.15.1. What steps do we need to take to determine this?

You should be able to realise that the minimum level of sales can be calculated by finding out how much each kg of tomatoes contributes to the fixed costs, that is, how much of the selling price is left after deducting the variable costs per kilogram?

Activity	Currency Amount in Rupees
Selling price per kg	15.00
Variable cost per kg (purchase price plus allowance for wastage)	12.00
Margin or 'contribution' per kg	3.00
Total fixed costs and personal drawing/wage	50.00
Number of kg that must be sold to cover total fixed costs and personal drawing/wage (=Rupee 50/3 = 16.66)	17.00

The number of kg that must be sold to cover the fixed cost is 17.

What we have now calculated it is what is called the 'break-even point' for the tomato vendor, that is, the level of sales at which she makes no profit (beyond the wage) and no loss. This figure provides a vital guide when someone is proposing to start a new microenterprise, and it is also useful when advising someone whose business is losing money. If it appears possible to reach the break-even point, it may be worth continuing the business, but if not, it may be necessary to make fundamental changes or even to close the business down. An entrepreneur should be able to realise that the minimum level of sales can be calculated by finding out how much each kilogram of tomatoes 'contribute' to the fixed costs, that is, how much of the selling price is left after deducting the variable costs per kilogram.

3.15.2. Ways to Increase Profit

Examples of increasing revenue include: Selling more by reducing price. Aggressively promoting the product Changing places where it is sold. Making the product more attractive. Increasing quality, *etc.*

Expenditure can be reduced by taking measures on cost components between the producer and consumer. Examples of reducing expenditures include;

Acquiring supplies from more affordable sources Joining with other traders to reduce the cost of transportation or selling costs.

Record Keeping

3.16. Exercise 17: How to do the Record Keeping

Assume that you're employed by Tuma's businesses and your responsibility is to keep proper records of all business transactions for each month. Prepare: a) Sales receipt b) Daily cash records c) Monthly cash book d) Stock report e) Profit/loss statement and Cash Flow Statement. The Daily sales record form, Receipt book, Cashbook, Stock Control, Profit or loss statement and Cash flow statements are the important tools of record keeping and the brief is given below:

3.16.1. Daily Sales Record Form

This form is used to record all daily sales. It helps to establish the total sales per day.

3.16.1.1. Daily Cash Records

DATE				
S.No.	Particulars	Quantity	Price	Amount
Total Sale				

Name of Business	
Address	
PIN 000-01100	
TAN No.	
Date	
Received from	
Being payment of	
Amount in words	
Amount in figures	Signature of receiver

3.16.3. Cash Book

The cashbook is used to records all cash transaction of the business usually after specific periods of time, that is, monthly, quarterly, semi-annually or annually.

A cash book: Records sources and uses of cash. Records who has input what capital, and when. Records selling prices at market Can help decide how to share profits. Can help budget (and thus save) for the future.

To calculate the balance of the cash book, take the greater total and subtract the lower one. If the expenditure side is greater than the revenue then balance should be recorded in revenue side but counted as debt.

Cash Book for the Month		Year	
Date	Particulars	Revenue	Expenditure
	Opening balance XXX	XXX	YYY
	Total		
	Closing balance	XXX	YYY

3.16.4. Cash Book in Statement Form

CASH BOOK FOR THE MONTH OF		YEAR
DATE	PARTICULARS	Amount
	Revenue Collected	XXX
	Less expenditures	
	Closing balance	XXX

3.16.5. Stock Control

Stock Control					
Date		Month		Year	
Date	Particulars	Stock In	Stock Out	Stock Balance	
	Closing balance				

3.16.6. Profit or Loss Statement

Profit or Loss Statement (Income Statement)		
Sales		XXXXXXX
Less: cost of goods sold		
Opening stock	XXXXX	
Add: Purchases	XXXXXX	
	XXXXXX	
Less: closing stock		XXX XXXXX
Gross Profit		XXXX
Less: Operating cost / Expenses All indirect expenses		XXX
Net Profit / Loss		XXX

3.16.7. Cash Flow Statement

Cashflow Statement for the Period ending Year												
Month	1	2	3	4	5	6	7	8	9	10	11	12
Cash at the start of the business												
Cash in from sales												

Any other cash												
Total Cash-In												
Cash out for direct or materials cost												
Cash out for direct labour costs												
Cash out for indirect costs												
Cash out for investment												
Any other cash out												
Total Cash-Out in Hand at the End of the Month												

All the participants to imagine that they own a business in their areas of residence and they are selling different goods in their business. Then ask them to write a receipt for the goods they have sold to their customers and to also record the sales in the Daily Sales Forms. Participants should record credit sales in the credit sales book.

3.17. Exercise 17: Savings

A Person named AAA starts to prepare budget by tracking their income and expenditure for a month

AAA person salary	4,000
Other Family member salary	10,000
Bonus and allowances from work	2,500
Business part 1	1,500
Business part 2	2,500
TOTAL	20,500
Tuition fee	1,000
School bus fare	200
Sports and games	150
Books and library	300
Food	1,600
Postal services	300
Electricity bills	300
Water bills	200
House detergents	100
Car maintenance	800
Car fuel	1,500
Shopping	1,000
House maid salary	1,500
Gardener salary	1,000
Rent	1,200
Car insurance	100
Miscellaneous expenses (makeup, perfumes, lotions etc)	600

The person name AAA prepares the budget first starting by categorising income and expenses.

Details	Amount in Rupees	To fil Your Example
INCOME		
AAS's salary per month	4000	
Family BBB's salary per month	10,000	
Bonus and allowances from work	2,500	
Business Income		
Business Part 1	1,500	
Business Part 2	2,500	
Total Income	20,500	
Expenses		
Home		

House rent	1,200	
House maid salary	1,500	
Gardener salary	1,000	
Post services	300	
Food		
Food/Drinks	1,000	
Drinks	600	
Utilities		
Electricity	300	
Water	200	
Telephone and cell phone	500	
Gas	200	
Home detergents	100	
Family Obligation		
Medical services	1,000	
School fees	1,000	
Sports and games	150	
Transport		
Car maintenance	800	
Car insurance	100	
Car (fuel)	1,500	
Entertainment		
Recreation and eating out	2,000	
Other Expenses		
Shopping	1,000	
Miscellaneous (makeup, lotion *etc.*)	600	
Total	15,050	
Surplus	5,450	

Person AAA's budget has a surplus of Rs. 5,450. That means AAA can save Rs. 5,450 every month. To increase AAA's family savings, AAAy can cut down expenses, for example, he/she can reduce recreation so that instead of going out every week they can go out twice a month so instead of using Rs. 2,000 they will spend only Rs 1,000 thus saving Rs. 1,000. He/She can also reduce miscellaneous expenses to Rs 400 and increase savings. AAA also can adjust expenses, where he/she does not use money as planned. For example if he/she only spends 50% of the medical expenses. The remaining money can be saved and this can increase savings in the family.

This example needs to be followed in all the entrepreneurial businesses also. This also tired to state that even the minor income and the expenditure need to be seen and analysed to increase savings and in terms of business it is profit.

3.17.1. Example of Informal group saving:

A group of 20 youth forms itself into a savings group. As an initial membership fee, each member has to contribute a small amount (Rs. 1,000). All monetary transactions are written in a group savings book and the money will be deposited at a local bank in a group savings account. The group meets every week and for each meeting, each youth has to bring a specific small amount (Rs. 500). This means, within a period of two months, the group has accumulated an amount of (Rs. 80,000) as starting capital. Now, the group can start an enterprise without having to approach a bank for credit (or if you apply for credit now, you will be much more likely to get it as you have shown that you are capable of saving). Alternatively, the group can start giving out loans to their members (at the same time, the normal weekly meetings continue, that means the capital is further increased). Conditions for loans could be that everyone has to agree to a loan given to any one person; that two other group members stand in as referees/safety (that means if the person fails to repay, they have to do it); that the loans have to go round (*e.g.* a person won't get a second loan before all others have received one); that the loans have to be paid back within one month; that the loans start initially with a small amount (to see if the person can be trusted); that the loans cannot exceed double your contributions; that no more than two loans can be given each month; that no new loans are given as long as people have not paid back. Over time, the conditions can be changed, *e.g.* the amounts for loans can be increased or a small interest charged.

The below given Questionnaire is necessary to understand plan for the future for investment or savings / profit etc:

1.	How much money, approximately, did I have available last month?	
2.	How much of that money, approximately, did I spend?	
3.	What were the main items or activities you spent your money on?	
4.	Was there any money left?	
5.	If yes, what did I do with it?	
6.	If not, what would I have done with any money that I did not spend?	
7.	Are there items or things that you cannot afford because you have no money left at the end of the month? Which ones?	
8.	Estimate how much money you would need to afford these items or activities.	
9.	If you look at the items and activities you listed under Question 3, which ones could you do without in order to save money?	

3.18. Exercise 18: The marketing and business Consideration

This will help to understand the market and plan with your skills accordingly:

5 'P's	Marketing questions	Business Skills
People	Who are my customers?	State your major target customers. They should be enough to consistently buy your product/service. These are people who you will ensure are the first to know you are in business and their purchases forms the foundation of your sales. They can be individuals, companies, other entrepreneurs, organization, local, regional, national or international.
	Answer:	
	What do they like? What do they need?	Services/product that will make them happy because their needs have been met/their problem has been solved.
	Answer:	
	Do they have money to buy my products?	Consider the capacity of the people to afford your service/ product. This largely determines their interest (interest + affordability is known in business as demand).
	Answer:	
Product	How do I make or get the product?	You should make your product in such a way you reduce the cost of production while maintaining standards of high quality.
	Answer:	
	Does it meet the customer's needs?	A product that solves a problem/need among the people is what will be bought. Such can only be developed after you conduct a market research (market need assessment).
	Answer:	
Place	Where will I start my business?	Very important to consider the location. First, it must be easily accessible to customers, Second, consider the impact of location to your overall cost of business (do you have to pay rent? Are your products safe?).
	Answer:	
	Is it convenient for the customer?	Customers will always spent their money at a place that is convenient to them (they never want to feel extra - burdened to spend) consider distance from the customer or availability transport.
	Answer:	

Price	How much will it cost to get the product to the customer?	The cost of production must be the minimum possible for production of a quality product. This will ensure your prices are competitive while at the same time raising profits.
	Answer:	
	How much will they pay?	Determine your price after considering your overall expenses of production, the other prices in the market and profit you want.
	Answer:	
	Will I make profit?	This is determined after you have taken into account all the costs involved until the product gets to the customer and comparing the market price by your competitors.
	Answer:	
Promotion	How will I let people know that I am in business?	Use the most effective and affordable means of advertisement. This depends on the type, distribution and exposure of your customers and also the type of product/service.
	Answer:	
	How will I attract them to my business?	Things that attract people to business are simple: o Use of good language while taking to customers. o Showing interest in them when you are talking to them (simple gestures like a smile means a lot) good packaging, display and presentation of your products. o Talk to people positively and confidently about your product.
	Answer:	
	How will they know my product is better than another?	You should try to have samples or demonstrations of your product or service and confidently tell people that your product is the best.
	Answer:	

This exercise will be very helpful for establishing a good, profitable and sustainable entrepreneurship.

3.19. Exercise 20: How to Plan Your Marketing Strategy?

Recall the business idea you came up with in the earlier session exercises, in your small group discuss and share your thoughts, suggestions and ideas about the questions above the same. Write your answers in the table below.

5 'P's	Marketing strategy pillar questions	Write your answers here
People	Who are my customers?	
	What do they like?	
	What do they need?	
	Do they have money to buy my products?	
Product	How do I make or get the product?	
	Does it meet the customer's needs?	
Palace	Where will I start my business?	
	Is it convenient for the customer?	
Price	How much will it cost to get the product to the customer?	
	How much will they pay?	
	Will I make profit?	
Promotion	How will I let people know that I am in business?	
	How will I attract them to my business?	
	How will they know my product is better than another?	

3.20.1. Value chain analysis

In business, we're paid to take raw inputs, and to “add value” to them by turning them into something of worth to other people. This is easy to see in manufacturing, where the manufacturer “adds value” by taking a raw

material of little use to the end-user (for example, wood pulp) and converting it into something that people are prepared to pay money for (*e.g.* paper). But this idea is just as important in service industries, where people use inputs of time, knowledge, equipment and systems to create services of real value to the person being served – the customer.

3.19.2. How do you find out where you can create value?

Value Chain Analysis helps you identify the ways in which you create value for your customers, and then helps you think through how you can maximize this value: whether through superb products, great services, or jobs well done. Value Chain Analysis is a three-step process: 1. Activity Analysis: First, you identify the activities you undertake to deliver your product or service; 2. Value Analysis: Second, for each activity, you think through what you would do to add the greatest value for your customer. 3. Evaluation and Planning: Thirdly, you evaluate whether it is worth making changes, and then plan for action. We follow these through one-by-one:-

3.19.2.1. Step 1 – Activity Analysis

The first step to take is to brainstorm the activities that you undertake that in some way contribute towards your customer's experience. At a business level, this will include the step-by-step business processes that you use to serve the customer. These will include marketing of your products or services; sales and order-taking; operational processes; delivery; support; and so on (this may also involve many other steps or processes specific to your business).

At a personal or team level, it will involve the step-by-step flow of work that you carry out. However, it could also involve other activities. For example: How you recruit people with the skills to give the best service. How you motivate yourself or your team to perform well. How you keep up-to-date with the most efficient and effective techniques. How you select and develop the technologies that give you AN edge. How you get feedback from your customer on how you're doing, and how you can improve further.

Some advice if you have a team working in your business If you carry out the brainstorming behind the Activity Analysis and Value Analysis with your team, you'll almost certainly get a richer answer than if you do it on your own. You may also find that your team is more likely to “buy into” any conclusions you draw from the exercise. After all, the conclusions will be as much theirs as yours. Once you've brainstormed the activities which add value to your company, list them. A useful way of doing this is to lay them out as a simplified flow chart running down the page – this gives a good visual representation of your “value chain”.

3.19.2.2. Step 2 – Value Analysis

Now, for each activity you've identified, list the “Value Factors” – the things that your customers value in the way that each activity is conducted. For example, if you're thinking about a tree seedling business, your customers will value an elaborate explanation of how to care for the seedling after planting; a polite manner; efficient taking of order details; fast and knowledgeable answering of questions; and an efficient and quick resolution to any problems that arise. If you're thinking about delivery of a professional service, your customer will most likely value an accurate and correct solution; a solution based on completely up-to-date information; a solution that is clearly expressed and easily actionable; and so on. Next to each activity you've identified, write down these Value Factors. And next to these, write down what needs to be done or changed to provide great value for each Value Factor.

3.19.2.3. Step 3 – Evaluate Changes and Plan for Action.

By the time you've completed your Value Analysis, you'll probably be fired up for action: you'll have generated plenty of ideas for increasing the value you deliver to customers. And if you could deliver all of these, your service could be fabulous! Now be a bit careful at this stage: you could easily waste your energy away on a hundred different jobs, and never really complete any of them. So first, pick out the quick, easy, affordable wins – go for some of these, as this will improve your spirit and that of your team. Then sort out the more difficult changes. Some may be impractical. Others will deliver only small improvements, but at great cost. Drop these. And then prioritize the remaining tasks and plan to tackle them in an achievable, step-by-step way that delivers steady improvement and at the same time keeps your team's enthusiasm going.

Developing producer organizations

It is important to note that farmer entrepreneurs have been facing difficulties in making maximum profits from their sales due to lack of a collective bargaining power. This gives room for middle men and women commonly known as brokers to exploit them. As an entrepreneur you should join with other farmers to form groups or associations that will market your products. Below is a guideline and framework within which to form a successful association that will benefit you as an entrepreneur.

Key aspects of forming a group	Guideline and framework of forming a beneficial/ successful farmers association/group
1) Fair pricing	The members expect that a fair price will be negotiated on their behalf by their association. The group's stronger bargaining position should translate into better terms than members could have negotiated on their own. This creates the need for a mechanism that creates transparency in price determination.
2) Quality assurance	When a deal is made, there is a need to control the quality that the organisation has promised. Individual members may try to deliver lower quality produce but the association/group needs a system to maintain minimum quality requirements.
3) Coping with working capital constraints	Some farmers may face cash constraints and want fast payments, while the group needs time to complete transactions with the end buyer. This creates financial costs for the group as they need to have a working capital to pay members quickly.
4) Anticipating "side selling"	The organisation might provide a credit service or advance payment system to enable production. However, this entails a serious risk that farmers will "side sell" their produce to competing traders or processors, to whom they have no repayment obligation.
5) Distributing profits	When the organisation makes a profit, it will prefer to invest or increase its capital reserves, while the members will prefer shorter term benefits, *e.g.* better prices.
6) Differentiating services to members and non-members	Most economic organisations need contributions from members to achieve their business targets. However, members can sometimes be deterred from making such contributions if the benefits from the group's activities accrue to both investors and non-investors.
7) Task delegation and supervision of professional staff	The farmers' group may employ professional staff to support them. Board members need to have proper information to make good decisions. This means that staff must be transparent and willing to provide this information. At the same time, however, decisions about commercial transactions often need to be made quickly, and therefore the professional staffs needs to have sufficient autonomy to make these decisions.

3.20 Exercise 20: Farmer Entrepreneurship-Self assessment tool

Business skill	Skill level		
	Low	Medium	High
Understanding basic skills for starting and growing a business			
Setting goals and objectives			
Assess business risks			
Market analysis			
Evaluating competition			
Keeping basic records of income and expenses			
Define profit			
Forecast sales			
Itemize business expenses			
Prepare an operating budget			
Manage products cost			
Conduct SWOT analysis			
Eliminate safety hazards in the work place			
Manage production cost			
Calculate capital needed to start a business			
Calculate profit and loss			

Improve quality (value addition)			
Set fair and competitive prices			
Train employees			
Finance a business			
Aspects of business plan development			
Financial statements			
Description of the business opportunity			
Market strategy			
Executive summary			
Operational plan			
Operating budget			
Capital budget Start-up financing			
Identify business resources			
Other players in business - tree farmers			
Farmers associations			
Support government bodies			
Support NGOs			
Banks and other financial institutions			
Training and agricultural extension and forestry providers			

3.21. Exercise 21: How to prepare Enterprise Mission, Vision, Goals and Objectives?

Mission Statement describes the overall purpose of the organization. It may include statements such as: To operate profitably so as to create career opportunities and financial rewards the youth in our society.

Goals describe the long-term results, which you hope to achieve. These might be profit, employment or community service. Objectives specifically state what you plan to accomplish in a set period of time. These might be, for example I want to achieve sales 1million shillings at the end of the year.

3.22. Exercise 22: Identify potential business risks and planning for transition

Imagine you fall sick today and are hospitalized, or you are not able to work hard and run your business due to an unforeseen circumstance. What will be the source of income for your business, family and employees once a calamity befalls you? You need to put in place measures that would ensure continued operation of your business. Always get prepared by:

Always have someone you trust involved in your business. Get a person who is trained to run the business. Get the person you trust to know where your business papers, licenses, and cash are and how to maintain them. Let him/her have access to you property. Introduce Him/her to your suppliers are and how to access them. Train the person in preparation for them to assume responsibility for the continuation of my business. Induct the person with skills to meet the requirements of your customers delegated to him/her sufficient authority like signing power for your bank accounts. It is best to have all of the documents required for your business in a single file or notebook. The files should be available in case of emergency but kept confidential and in a safe place. You must have some of the documents on public display. Consult with someone you trust to protect your interests, your lawyer, your accountant, or your bank. You may want to give signing power to a spouse or someone within your immediate family.

Thus, it can be concluded that in general, once a business is profitable it should cover its expenses from its revenues. However some businesses are seasonal. Expenses will be incurred in one month or quarterly. Revenues will be realized later. For example, farmers collect revenue when crops mature. Ideally the business will earn enough money to carry it through the periods of low revenue. It is easier to sustain the business through those periods if there is a plan to save cash for that purpose.

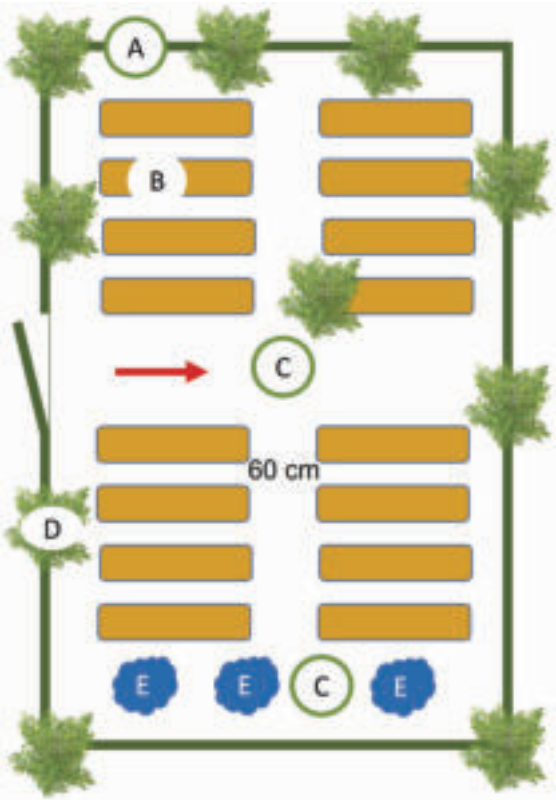
4. Developing Quality Planting Material -Tree Nurseries

Nurseries are essential for anyone interested in establishing agroforestry systems. They are the starting point for the tree that will take on a life in the field. Farmers can use nurseries to propagate seedlings either by vegetative methods or by seed. Careful planning and design of a nursery is important if high quality seedlings that will yield the best results in the field are to be raised.

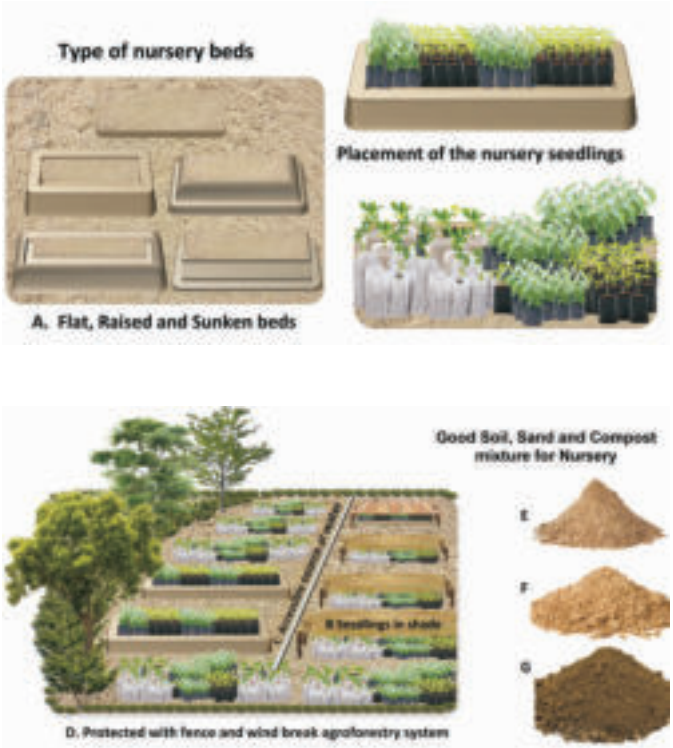
The details are given in the training manual and the figures of each activity are given below:

Site Selection

4.1 Figure 1: Site Selection



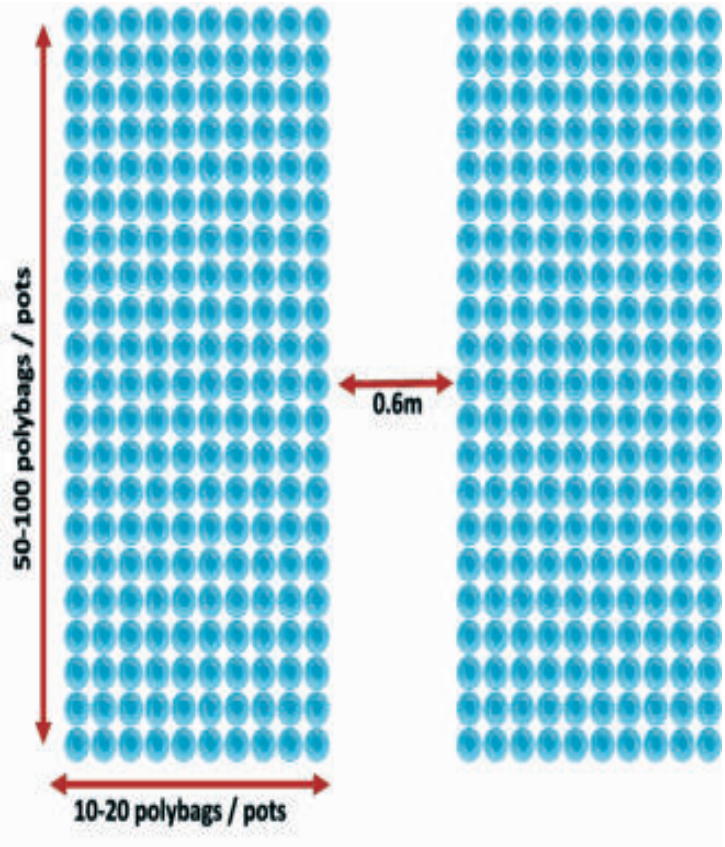
4.2 Figure 2: Criteria for building a Suitable Nursery site



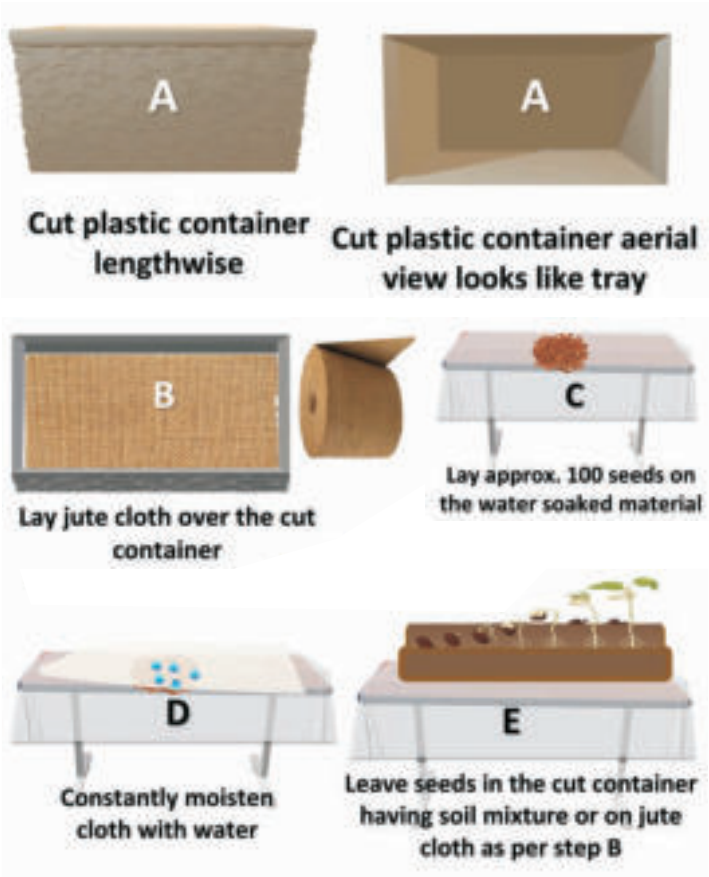
Source: Prof Dr Atul - Preparing, sketching 2D designs

Nursery Layout and Preparation

4.3. Figure 3: Nursery Layout



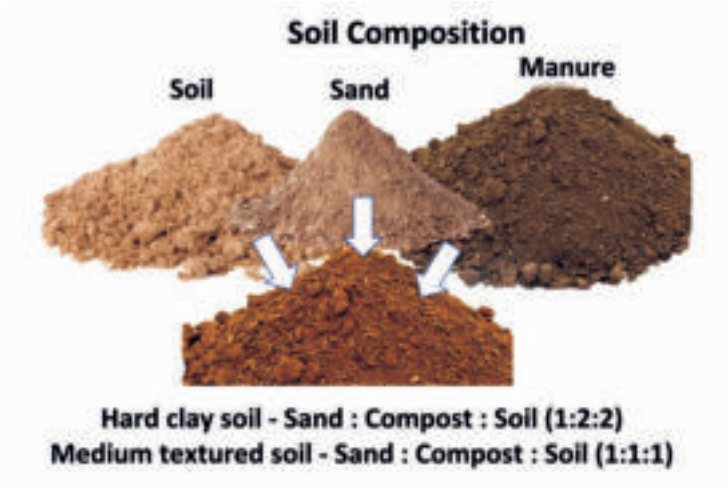
4.4. Figure 4: Seed Collection and Viability Testing



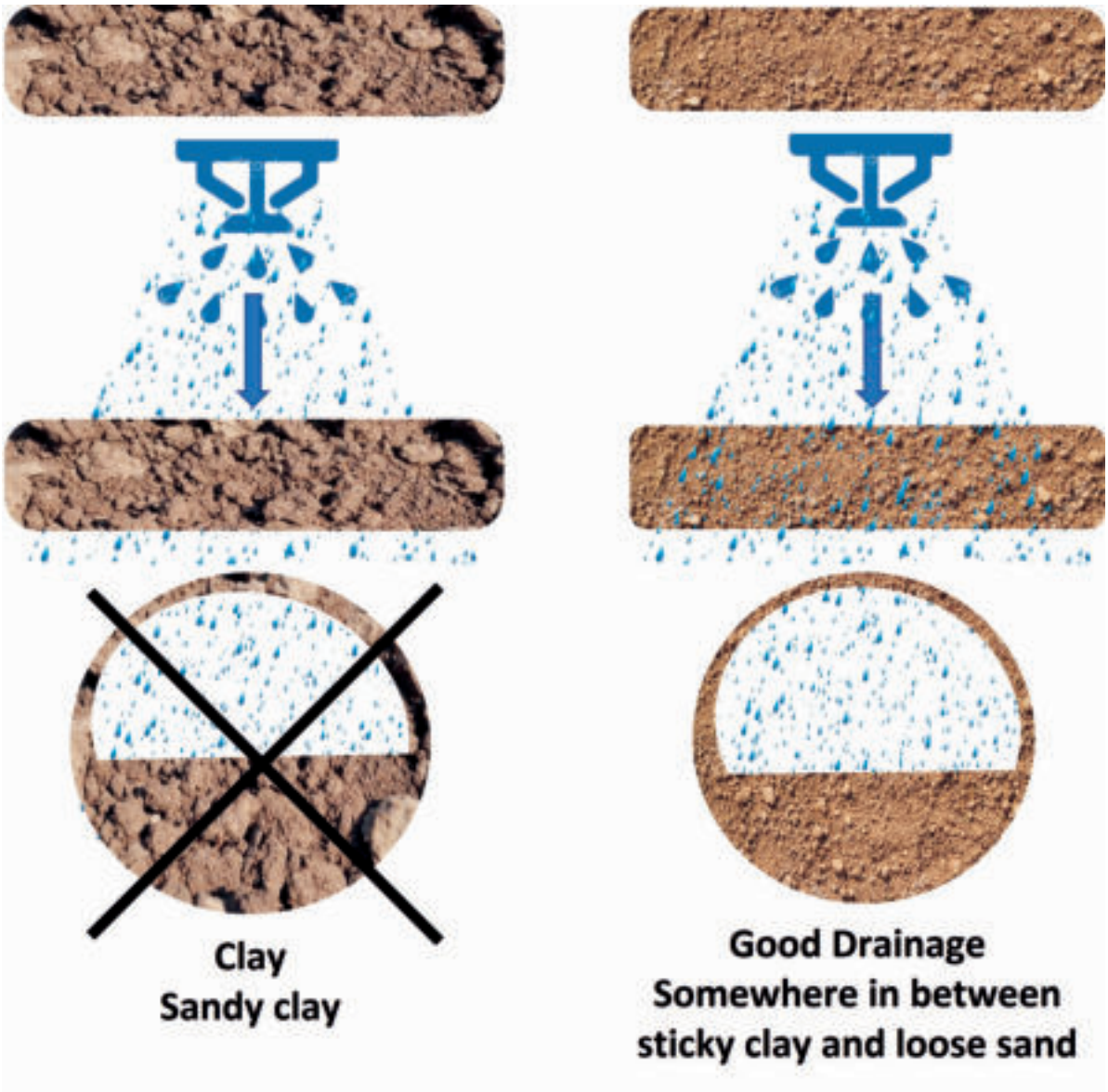
Source: Prof Dr Atul - Preparing, sketching 2D designs

4.5. Figure 5: Seed Water Treatment

4.6. Figure 6: Soil and Organic material preparation

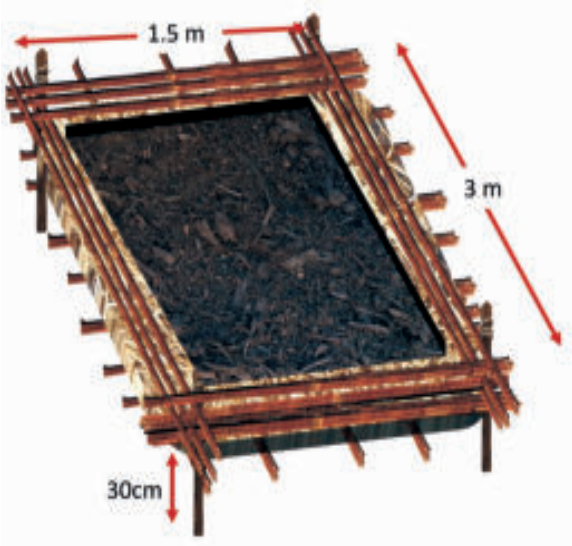


4.7. Figure 7: Soil Texture and Nutrient Contents

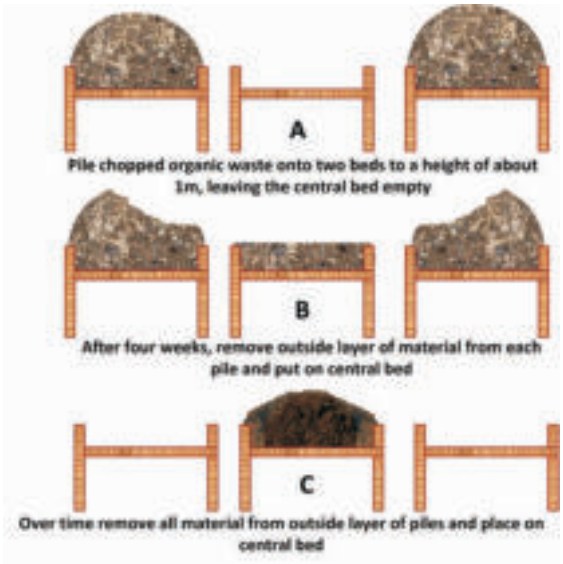


Source: Prof Dr Atul - Preparing, sketching 2D designs

4.8. Figure 8: How to make compost

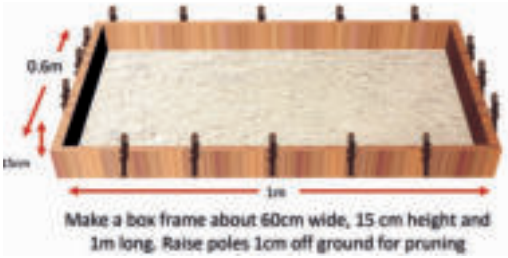


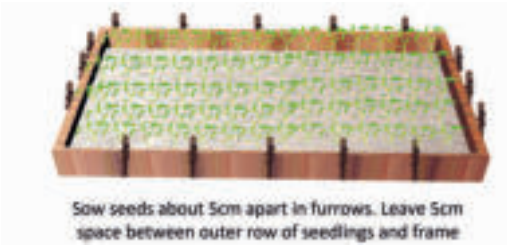
4.9. Figure 9: Three Bed Compost Making System



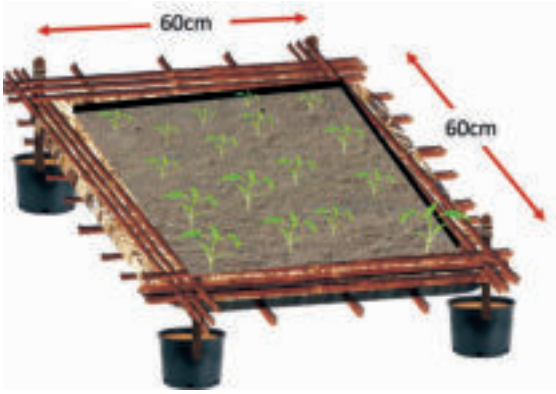
How to raise seedlings

4.10. Figure 10: Making and Using Seed Beds





4.11. Figure 11: Making and Using Seed Box



4.12. Figure 12: Making Open Bottomed Seedling Pots/Polybags

Source: Prof Dr Atul - Preparing, sketching 2D/3D designs

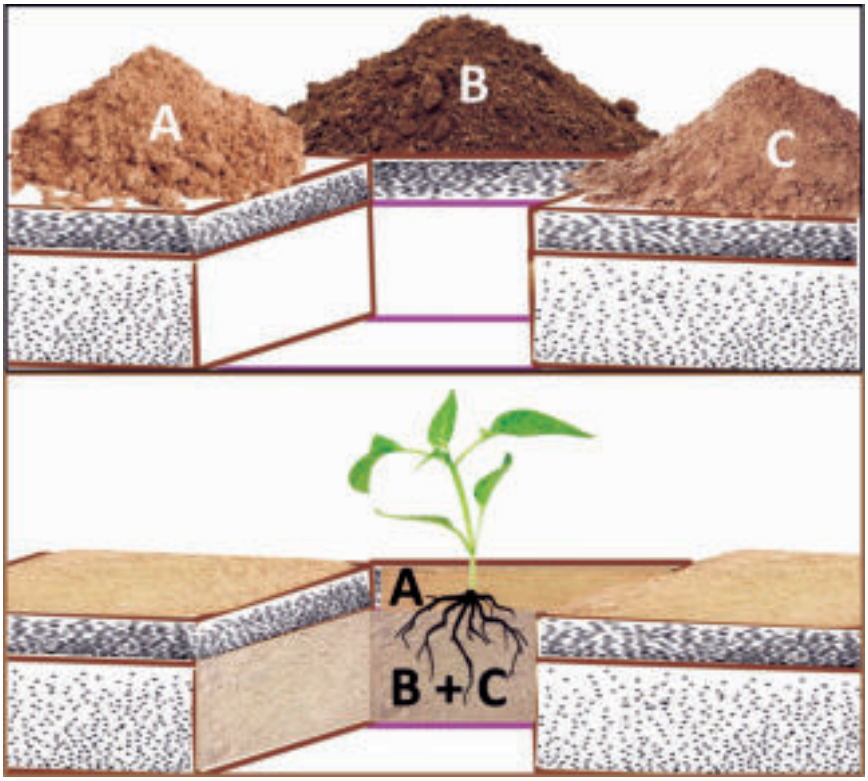
4.13. Figure 13: Shade arrangement in Nursery

Pricking out and Transplanting

4.14. Figure 14: Pricking out

4.15. Figure 15: Root Pruning Method

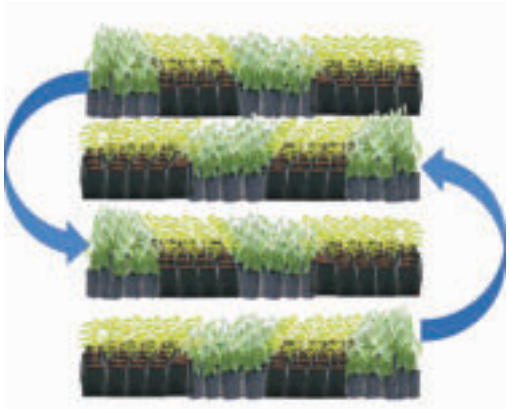
4.16. Figure 16: Hole Making for Plant out



Source: Prof Dr Atul - Preparing, sketching 2D/3D designs

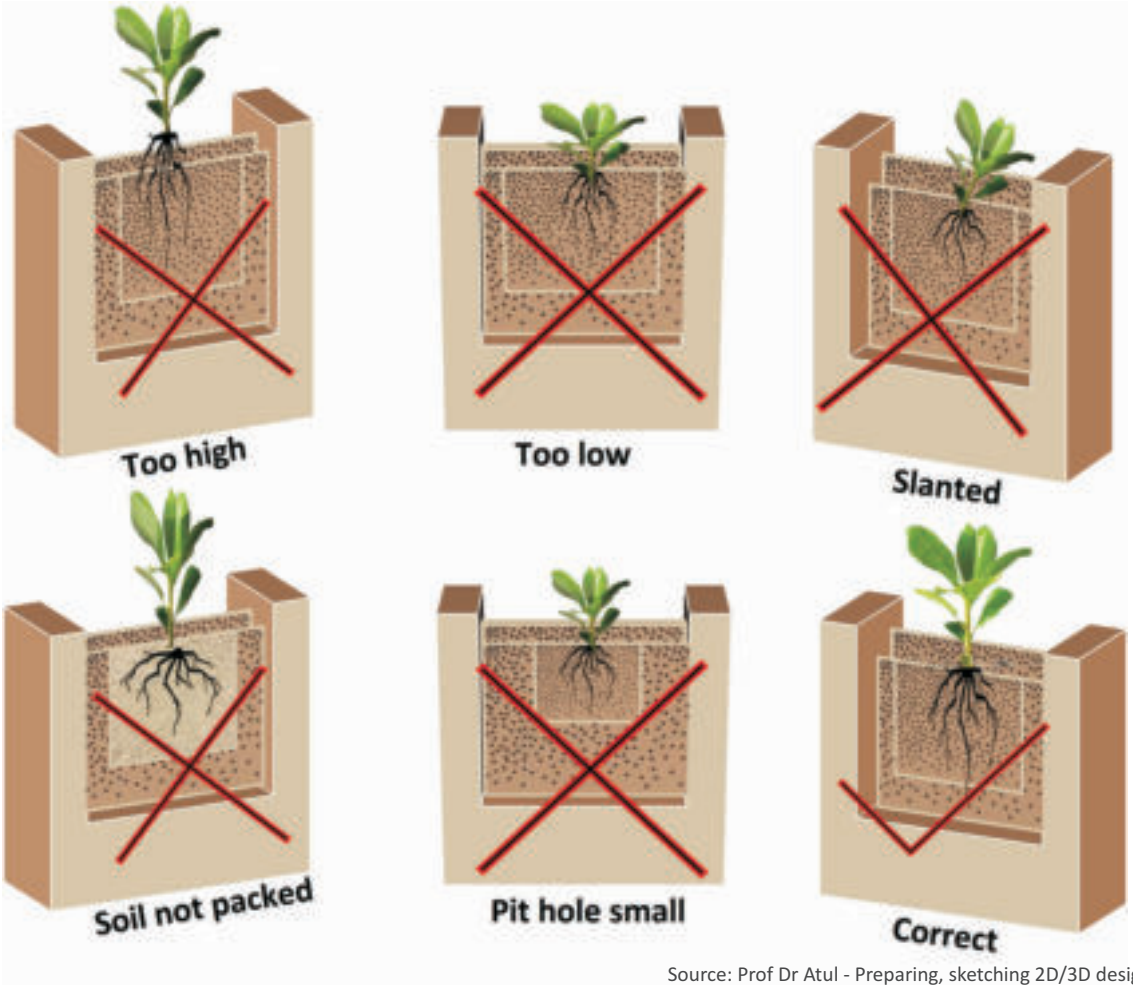
Seedling management

4.17. Figure 17: Periodic movement of Polybags/ Pots



4.18. Figure 18: Protective Seedling Enclosure

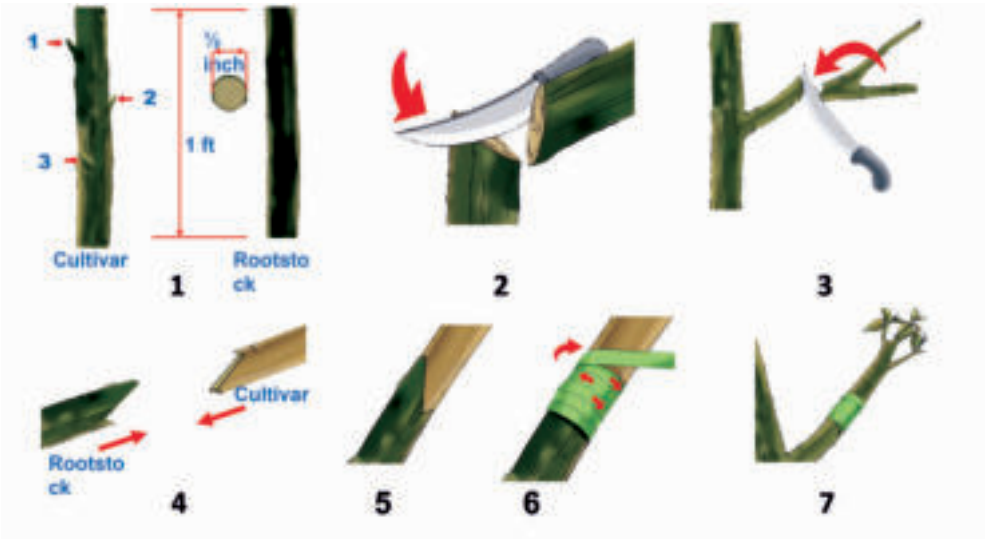
4.19. Figure 19: Planting Methods



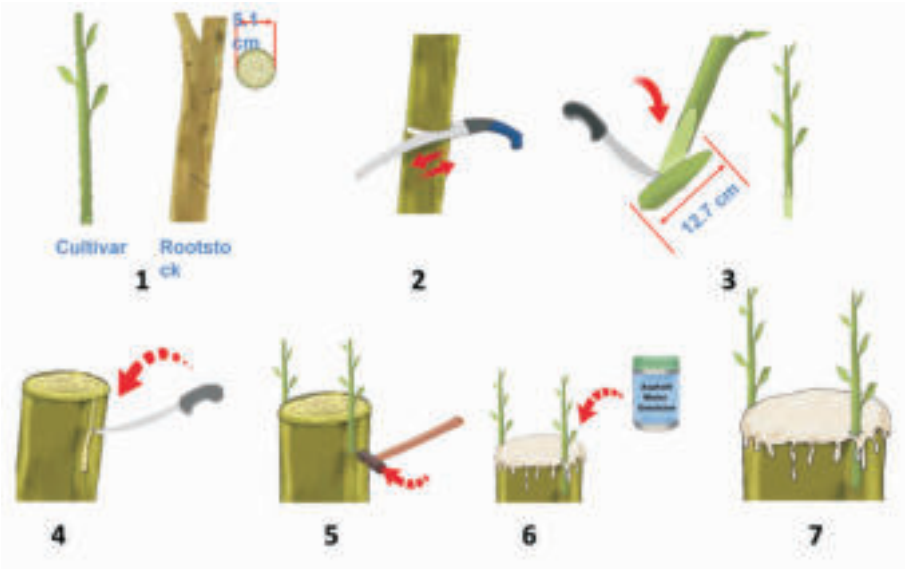
Source: Prof Dr Atul - Preparing, sketching 2D/3D designs

Vegetative propagation techniques

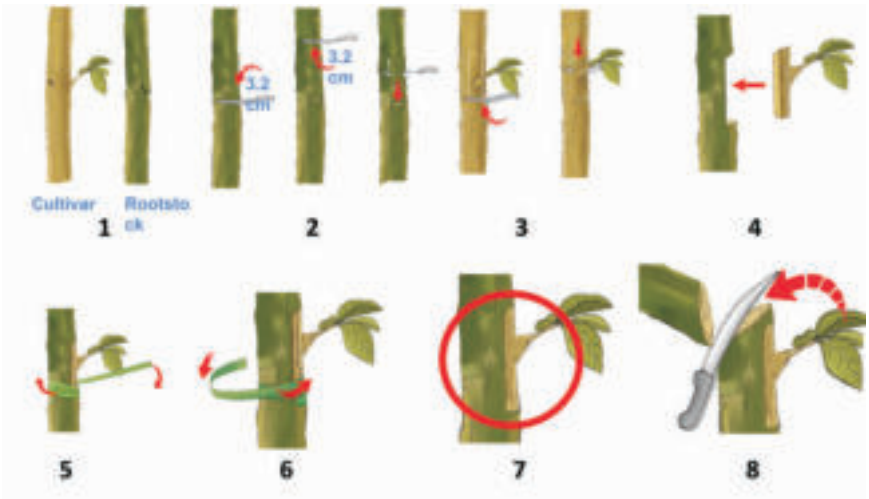
4.20. Figure 20: Wedge grafting



4.21. Figure 21: Cleft grafting

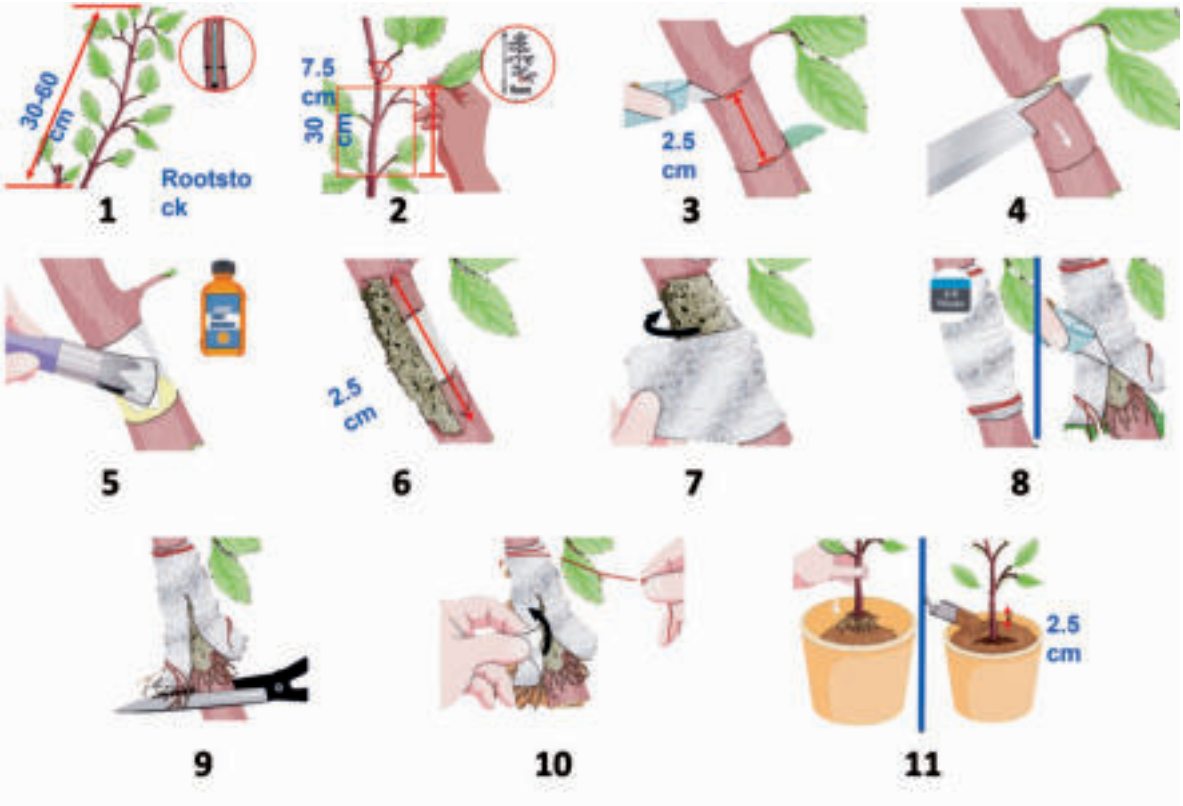


4.22. Figure 22: Chip budding

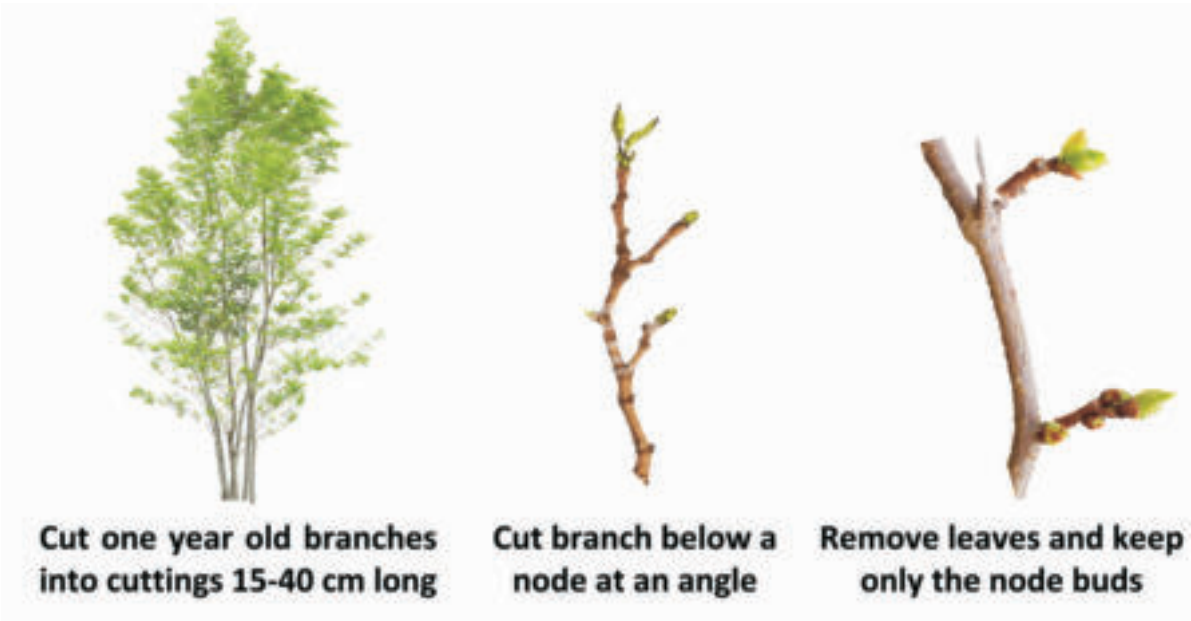


Source: Prof Dr Atul - Preparing, sketching 2D designs (due permission from wikihow.com)

4.23. Figure 23: Air Layering



4.24. Figure 24: Cuttings and Truncheons



Source: Prof Dr Atul - Preparing, sketching 2D designs (due permission from wikihow.com)

Certification of Quality Planting Material

4.25. Sample Guidelines for Certification of Quality Planting Material

The Indicative List as given in table below is Provided by the M.P. Forest Department for Quantitative Standards of Seedlings for Plantation

S.No.	Species	Age	Height (Min.)	Collar radius
1.	Bamboo plant raised by Rhizome	1.5 to 2.0 years	-	3-5 cm.
2.	Teak	1 to 1.3 years	9 inch	4-8 cm.
3.	Indian Rosewood (Shisham), Neem, Indian siris (white), Indian siris (black), Cassia, Eucalypts, Babul, Terminalia arjuna, T. bellirica, Jamun, Kadamb, Gumhar *etc.*	1 year	45 cm	1.5-2 cm.
4.	Acacia catechu, Mahua, Hardwickia, Adina cordifolia, Terminalia chebula, Indian gooseberry, Aegle marmelos, Tamarind, Sandal, *etc.*	2 years	45 cm	2-3 cm.
5.	Peltoforum, Delonix regia, Cassia siamia, C. fistula, Putranjeeva, Alstonia, Bauhinia purpurea, Spathodia, Jakranda, Karanj, Mango, Neem, Kadamb, Shisham, Bougainvillea, *etc.*	2 years	90 cm	3-5 cm.
6	Grafted Aonla	3-4 months after grafting	45 cm	2-3 cm.
7.	Clonal eucalypts	3-4 months	30 cm	1.5- 2cm
8.	Bamboo (polythene raised)	1.5-2 years		3-5 cm.
9.	Pre-sprout Teak (polythene raised)	1-1.25 years	9 inch	3.5-5 cm.
10.	Gumhar (*Gmelina arborea*)	3-6 months	45 cm	1.5-2 cm.

Modified from GOI (Government of India). 2016. Operational Guidelines Sub-Mission on Agroforestry (SMAF) under NMSA, Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare.

4.26. Application for Recognition of Accredited Nursery

1.	Name of applicant	
2	Name of nursery	
3	Full address	PIN: Email ID
4	Location of nursery	State:
		District:
		Town/village:
		GPS Coordinates:
5.	Constitution	Govt. / Private /Regd. Trust /Society:
6.	Year of establishment	(Mention year of initiating propagation)
7	Number of trained staff	(Give categories and technical qualifications, if any)
8	Facilities Area:	(Provide a layout map)
		Fenced or not:
		Propagation facilities available:
		Mist chamber :
		Green Houses:
		Nursery buildings: Masonry/Thatched/ other Equipments, if any
		Water Source:
		Irrigation system:
9.	List of mother plants available for multiplication	(List with details of origin)
	Fees paid	(Give details of mode of payment)
		Signature of applicant with date

4.27. Format of Certificate to be issued by Certified Nursery*

(LOGO)	Name of Certified Nursery	
	Certificate of Planting Stock	
	Valid from: to:	
	(To accompany each Batch of Planting Material produced in a Certified Nursery)	
A	Full address and contact details of Certified Nursery	
	Details of Certificate issued by Nursery Certifying Agency	
B	Name of species	
I	Scientific name	
II	Variety name/local name (if any)	
C	Origin of Planting Material	
I	Accession No./Clone No.	
II	Batch No.	
III	Batch size	
IV	Details of certification from competent authority	
V	Expected year of flowering	
D.	Propagation	
I.	Mode of propagation	(Seedlings/Rooted culm cuttings rhizome offsets/micropropagation).
II	Details of certification from NCS-TCP, DBT for TC plants	
E	Silvicultural Quality	
I	Age of planting material	
II	Number of healthy (leafy) tillers	Above 50 cm: Emerging:
III	Quality of rhizomes	Well-developed/Acceptable/Poor
IV	Quality of root system	Well-developed/Acceptable/Poor
F	Plant Health	
I.	Prophylactic treatments given	
II.	Incidence of diseases	
III	Incidence of pest	
IV	Whether certified virus free	
V	Symptoms of nutritional deficiencies, if any	
G	Approved Commercial end use	
I	Biomass for timber/ energy	
II	Eco-restoration	
III	Others (specify)	
H	Labelling	
I	Attach sample of label accompanying planting material	
II	Bar code	
Signature		Signature
Name		Name
Designation		Designation
Seal of certified nursery		Seal of designated official from appropriate Certifying Agency
Date:		Date :

4.28. Format of Label for Certified Quality Planting Material

Logo here
Name of Nursery here
Certificate No.
Validity period:
Address and Contact Number
Certified Quality Planting Material
1. Name of the species:
2. Common Name:
3. Clone No. and Name, if any:
Declaration
The planting material meets the specification and standards set by accreditation agency for certified Quality Planting Material.
4. Expected date of next flowering:
5. Age of planting material
6. Price
Barcode
Signature of Supplier with seal
Incase of complaints, write/call:
Telephone
Email

4.29. Type of Agencies that can be supported for tree planting financial assistance

The State Forest Department will be the nodal agency for enabling production and availability of QPM. It will either produce the QPM on its own or through collaborative arrangements with forestry/agricultural research organizations/Forest Development Agencies/farmers below poverty line/tree growers' cooperatives and Panchayats. Individuals/private entrepreneurs including farmers below poverty line/interested in setting up their own nurseries will be encouraged to set up satellite nurseries. Such individuals/entrepreneurs/farmers should be registered under provisions of relevant local acts and rules at the time of application.

For tree planting, financial assistance will be directly provided to voluntary agencies, farmers' societies, tree growers' cooperatives, PSUs, recognised educational institutions, trusts *etc.* For planting by government departments, money will be routed through the SFD (State Forest Department) under the Grants-in-Aid for Greening India Scheme.

The project proposals for financial assistance under the Grants-in-aid for Greening India Scheme of the National Afforestation and Eco-development Board (NAEB), hereinafter referred to as the Board, shall be entertained from:

a) Government Departments, Urban Local Bodies, Panchayati Raj Institutions

b) Public Sector Undertakings, Autonomous Bodies.

c) Registered Societies, Non-Profit Organisations, Cooperatives, Charitable Trusts, Voluntary agencies.

d) Registered Schools, Colleges, Universities

e) State Forest Department

4.30. Financial Support Cost norms for QPM Production

i)	Awareness, appraisal, extension and training	Rs. 8.00 lakh (lump sum for SFD only)
i)	Hi-tech central nurseries with mist chambers sprinkler irrigation, root trainers, other improved technologies using genetically diverse plant material of vegetative or seed origin obtained from properly established seed orchards, clonal orchards, plus trees	Rs. 10.00 lakh per 1 ha nursery (one time grant) for producing at least 1 lakh plants per annum. This is a grant for promotion of production of quality planting material.
iii)	Satellite nurseries using local technologies such as, thatch shades, can sprinklers *etc.*	Rs. 1.00 lakh per 1 ha nursery (one time grant) with production capacity of 1 lakh plants/annum[2].

4.31. Financial Support Cost norms for QPM Planting

i)	Government/community land (1100 plants/ha)	Rs. 25/- per plant inclusive of all costs comprising cost of plant, transportation, advance work, plantation, SMC, casualty replacement, protection, awareness and overheads.
ii)	Private land (1100 plants/ha)	Rs. 18/- per plant inclusive of all costs comprising cost of plant, transportation, advance work, plantation, SMC, casualty replacement, protection, awareness and overheads.
iii)	Abandoned mines/quarries, land affected by industrial waste, special problem lands like laterite Kankar pan, perpetual bouldery wastelands, steep slopes etc, (1100 plants/ha)	Rs. 30/- per plant, inclusive of all costs comprising amelioration of soil, cost of plant, transportation, advance work, plantation, SMC, casualty replacement, protection, awareness and overheads.

4.32. How to Appy for Voluntary Tree Planting

Application under the Grand-in-Aid for Greening India Scheme of National Afforestation and Eco-development Board (NAEB) is given below:

GENERAL INSTRUCTIONS

1. Please fill in all columns.
2. If space under any column seems insufficient, separate sheet may be attached; but gist of what you want to say should be given in the space provided.
3. Along with the application please enclose the requisite documents as stated in the guidelines of the scheme.

PART I: General		
1.1	Name and postal address of the Agency/Applicant Organisation:	
1.2	Name of the Post Office with PIN code:	
1.3	Name of the Police Station (with reference to the Organisation's address):	
2.	Telephone No. with STD code:	
	Fax No.:	
3.	Telegraphic Address:	
4.1	Name and designation of Chief Functionary:	
4.2	Telephone No. with STD code:	
4.3	Name and designation of other Members of the Executive Body:	
5.	Status of Organization (tick): Cooperative, Voluntary Agency, Registered Society, Trust, Any other (specify):	
6.1	Registration number and Date and Place of Registration:	
6.2	Name of the Registering authority and its address:	
6.3	Act under which registered:	
6.4	Validity up to:	
7.	Title of the project for which grant is sought:	
8.	Objectives of the project (in brief):	
9.1	Implementation of the project	
	(Explain in brief how the project will be implemented with special reference to the following points. In case any of them is not applicable, please write N.A.):	
9.2	Details of the land available:	
	(i) Type of land/Government/Revenue, Forests/Community/Private	
	(ii) Name of the block/village (iii) Name of Compartment/Khasra/title *etc.*	
9.3	Irrigation sources:	
9.4	Who will provide technical assistance, if required, to the agency?	
9.5	Organisation and management of work (Please give details of the organisational structure to implement the project especially at the field level);	
9.6	Any other salient features of the project you may wish to highlight:	
9.7.1	Present Bankers of the organization	
9.7.1	Name and Branch of the Bank	
9.7.2	Bank account number and type of account	
9.7.3	Postal address of the bank.	
10.	Past experience in the afforestation or related activities.	
	(i) Details of projects taken up in the last 10 years:	
	(ii) Fund availability and its sources for implementation of the above said projects:	

PART -II

Certificate to be Submitted with Application

Certified that :

1.	We shall abide by all the Terms and Conditions of the Grant.	
2.	We shall furnish such periodical/special reports as may be required by NAEB	
3.	Our books and records shall be open to inspection at all times to NAEB or their authorised representatives.	
4.	NAEB may, at their discretion, themselves or through their authorised representatives evaluate the physical progress/utilisation of funds for this project.	
5.	The undersigned shall be personally responsible for the credibility and authenticity of the information provided and documents attached with the proposal and legally liable for any default in this regard.	
6.	In the event of any default or deviation from the terms and conditions of sanction of the project, the Board shall have the right to recover the grant from the Agency.	

*Photograph of the Chief functionary of the applicant agency duly attested by a gazetted officer.

Signatures,

Names and Stamp of Chief Functionary of the Agency

Postal address:

Telephone Number with STD code:

* Name, designation and seal of the attesting official

4.33. Tree Planting -Financial support Cost Norms for various Sub-components

Sl.No.	Item of Work	Approved Cost Norms		
		For Govt./ Community land (1100 plants/ha.)	For Private land (1100 plants/ha.)	Abandoned mines/ Quarries/Special problem lands
1.	Nursery raising *	11000	11000	11000
2.	Plantation			
	(a) Advance Work	6320	3560	9000
	(b) Plantation	5000	3700	5000
3.	Soil & Moisture Conservation	1800	900	4000
	Sub-total	24120	18260	29000
4.	Overheads (up to 10% of sub-total)	1380	890	1600
5,	Awareness raising (up to 5% of sub-total)	700	450	700
6.	Protection	1100	-	1100
7.	Transportation (hilly and desert areas only)	200	200	600
	TOTAL	27500	19800	33000

* Cost of purchase of QPM from nurseries established under the scheme.

5. Developing Agroforestry Model Technologies

Multiple Use Tree Technologies

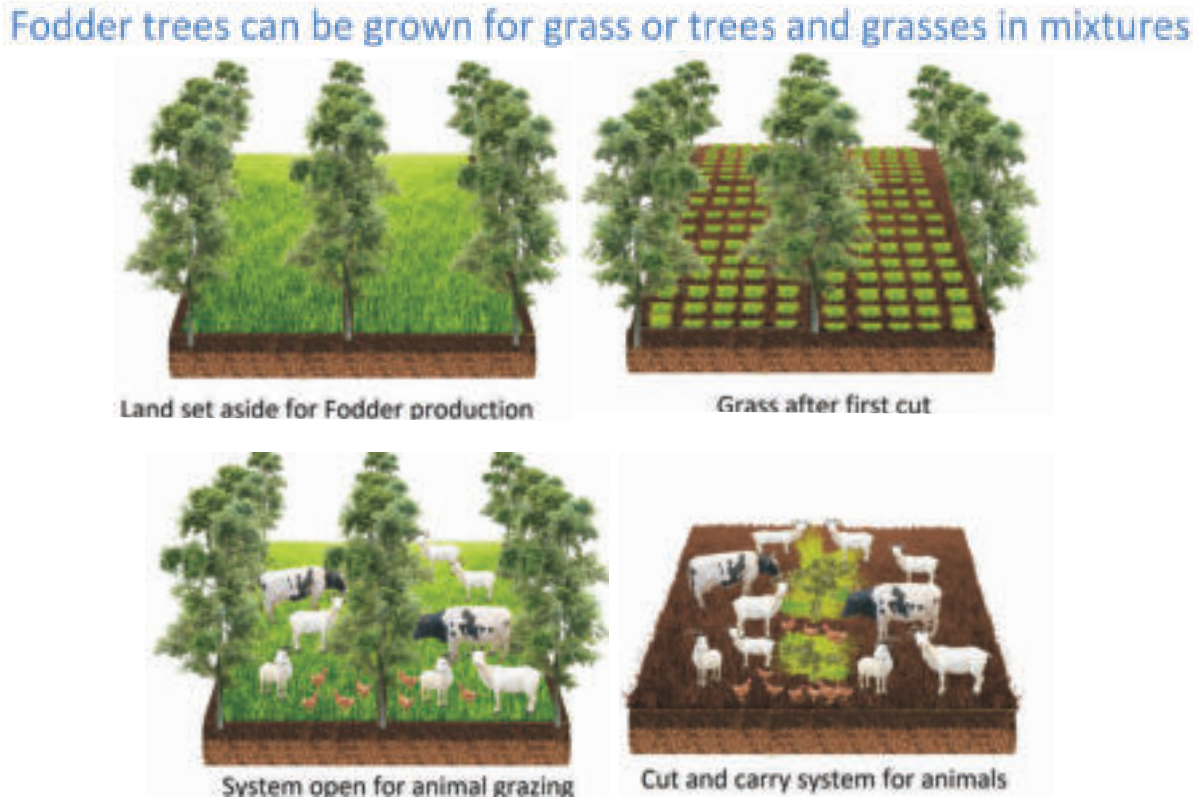
5.1. Figure 1: Multiple Use Tree Technologies

Living Fences

5.2. Figure 2: Living Fences

Fodder

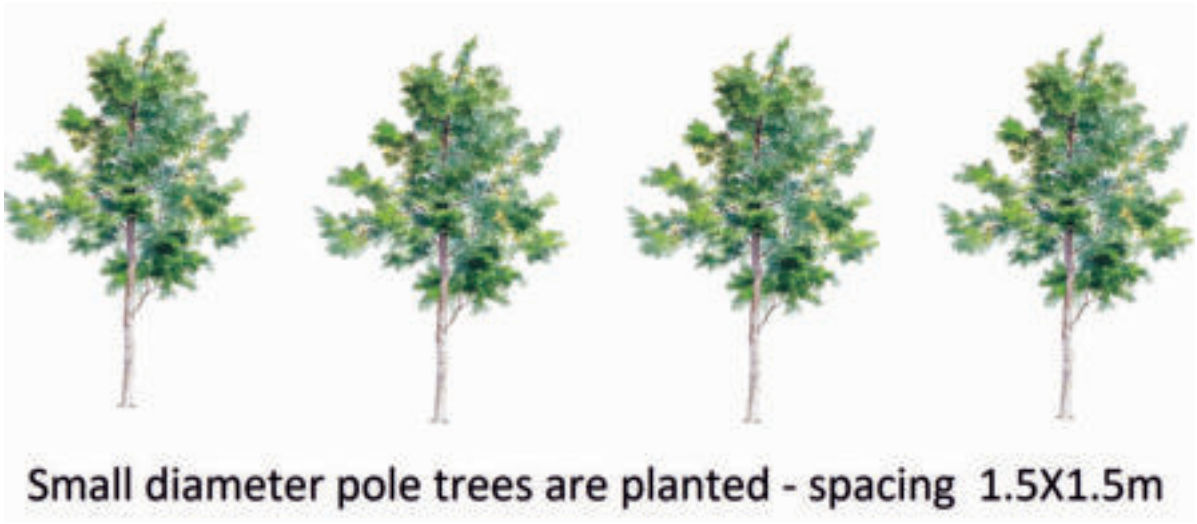
5.3. Figure 3: Fodder trees

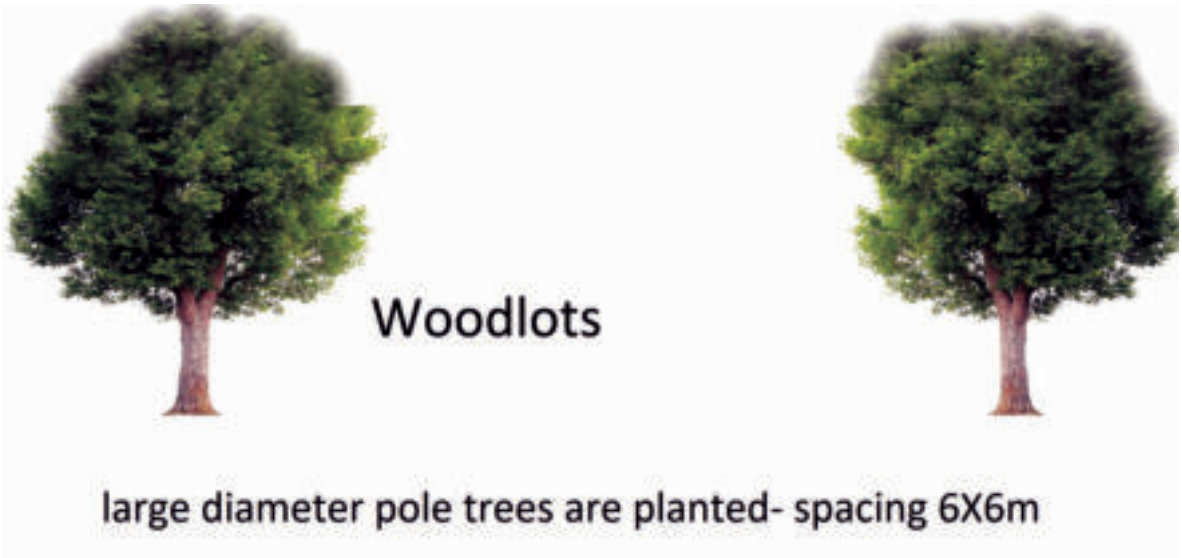


Source: Prof Dr Atul - Preparing, sketching 2D/3D designs

Woodlots

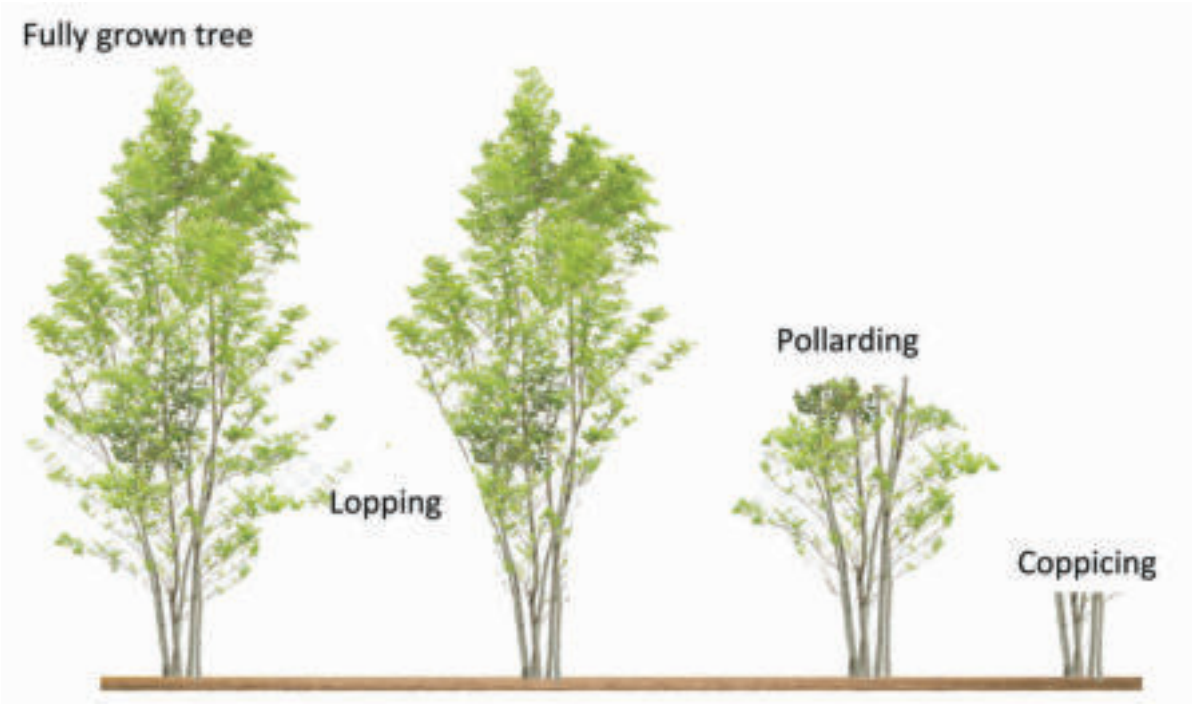
5.4. Figure 4: Woodlots





Source: Prof Dr Atul - Preparing, sketching 2D/3D designs

5.5. Figure 5: Coppicing, Pollarding



Multipurpose Tree (MPTs) Gardens

5.6. Figure 6: Multipurpose Trees Gardens

Source: Prof Dr Atul - Preparing, sketching 2D/3D designs

Orchards

5.7. Figure 7: Orchards system of Agroforestry

Taungya

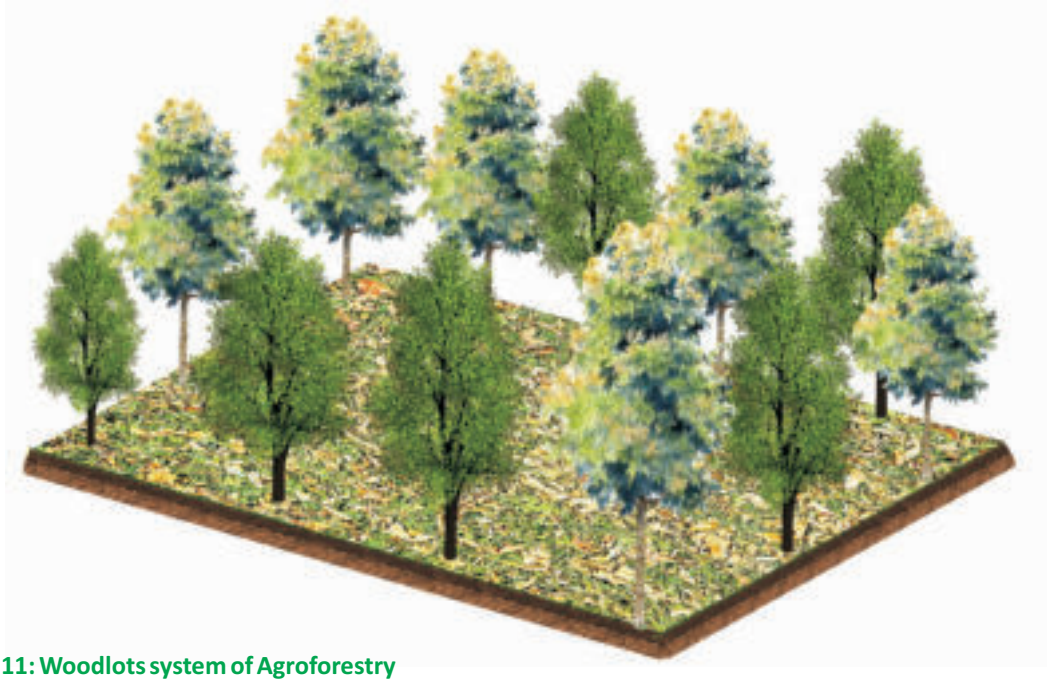
5.8 Figure 8: Taungya system of Agroforestry

Systematic Tree Intercropping

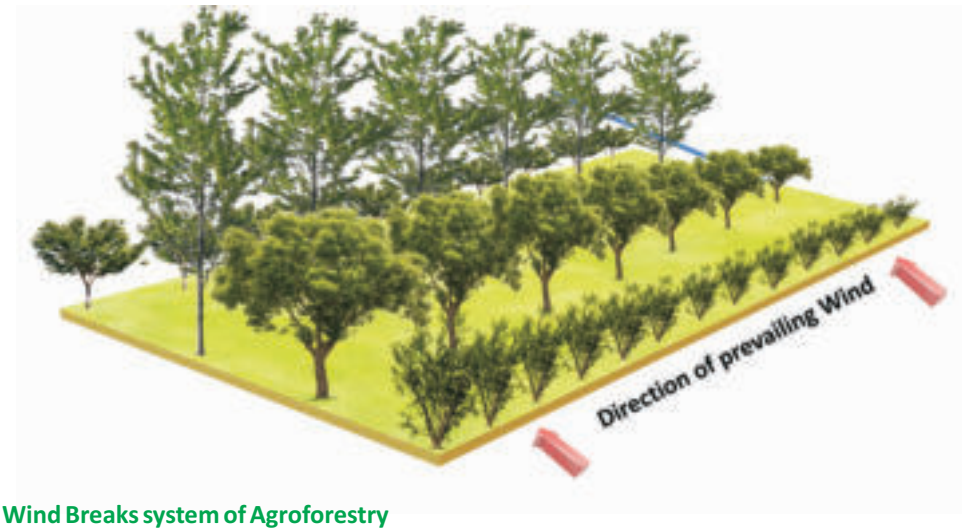
5.9. Figure 9: Tree Intercropping

Source: Prof Dr Atul - Preparing, sketching 2D/3D designs

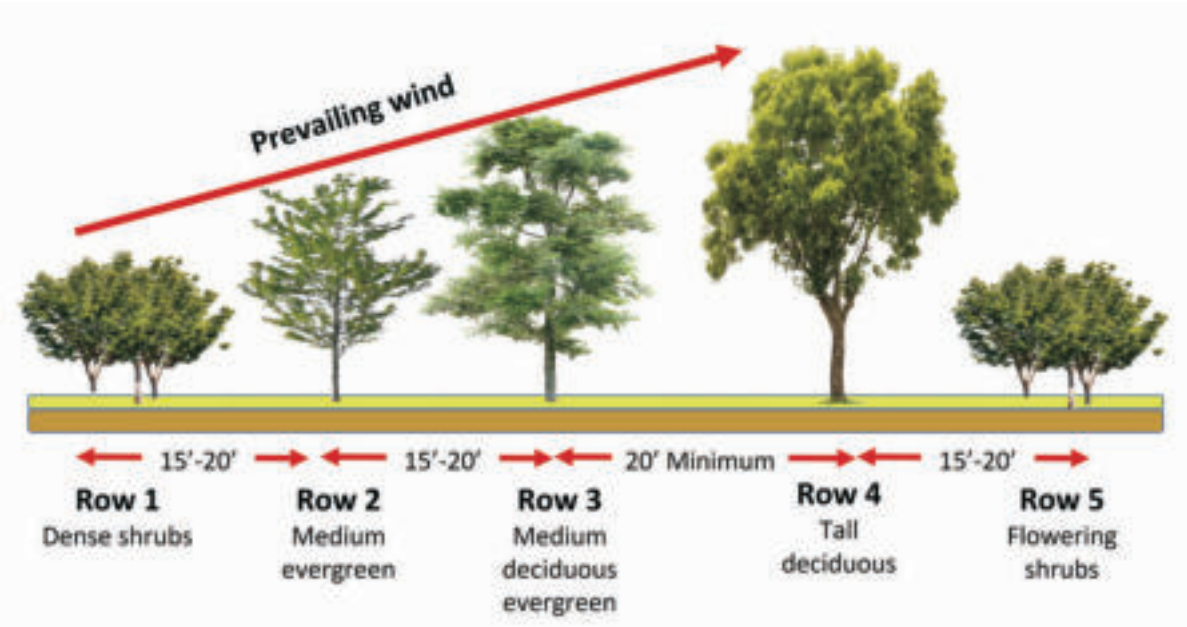
5.10. Figure 10: Trees on Boundaries



5.11. Figure 11: Woodlots system of Agroforestry



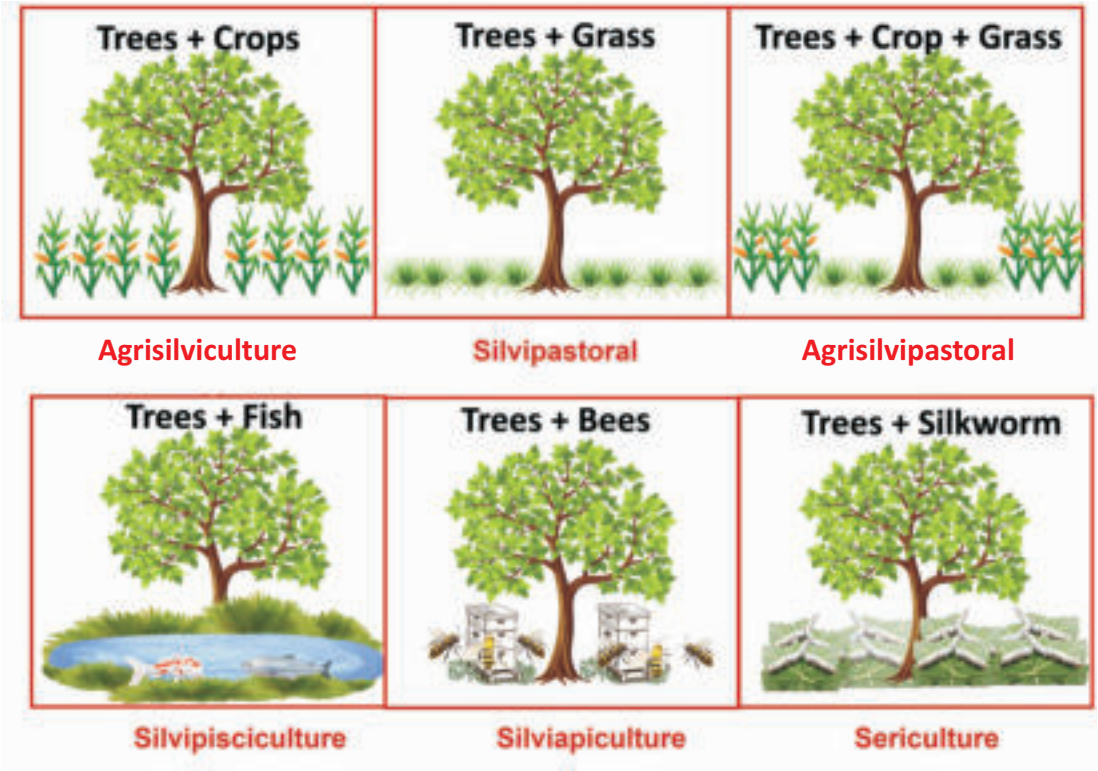
5.12. Figure 12: Wind Breaks system of Agroforestry



Source: Prof Dr Atul - Preparing, sketching 2D/3D designs

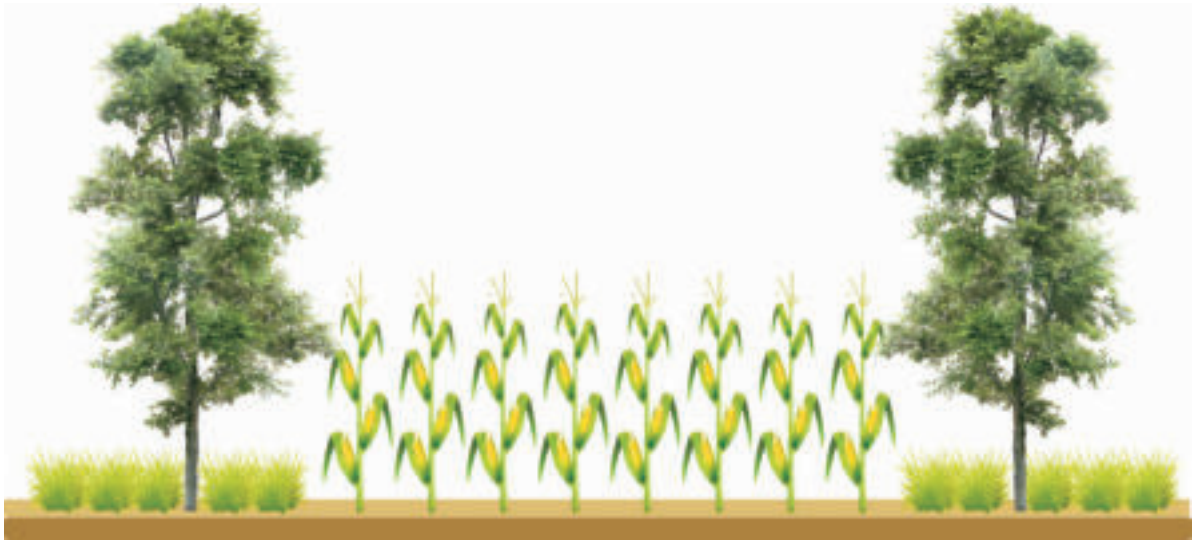
5.13. Figure 13: Alley Cropping system of Agroforestry

5.14. Figure 14: Intercropping of Trees in Agroforestry



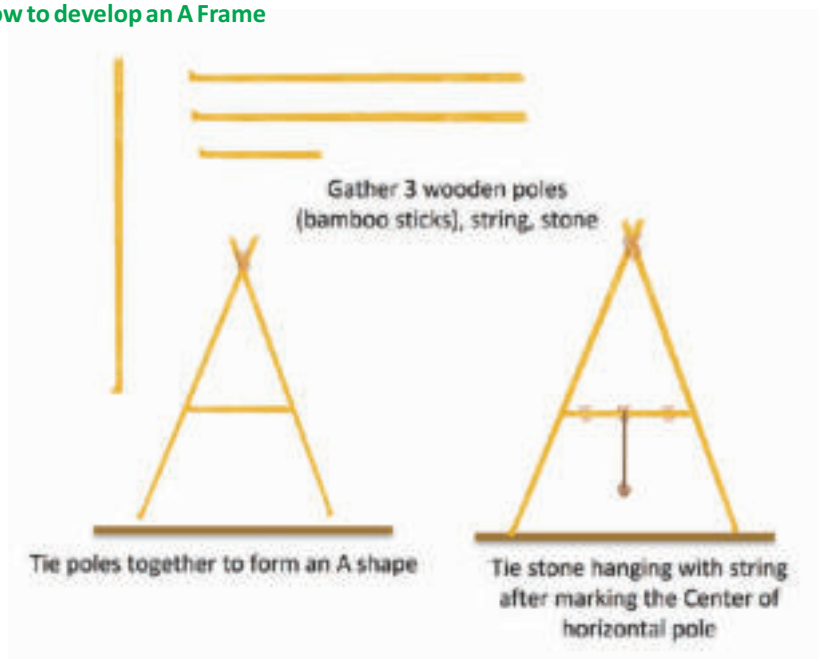
Watershed Management Technologies

5.15. Figure 15: Watershed Management Technologies



Source: Prof Dr Atul - Preparing, sketching 2D/3D designs

5.16. Figure 16: How to develop an A Frame



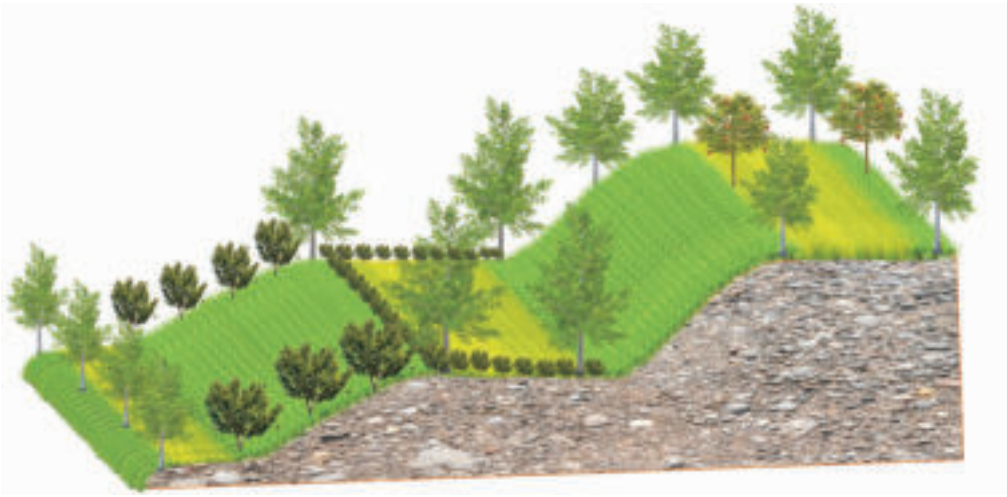
"A frame" demonstration by CSK HP Agricultural University Palampur, HP India

Source: Prof Dr Atul - Preparing, sketching 2D/3D designs

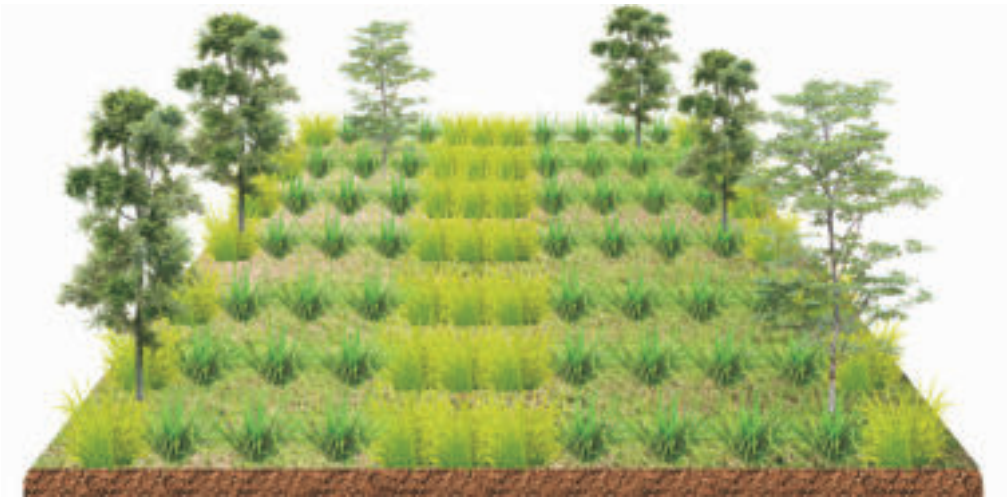
Contour Plantations

5.17. Figure 17: How to do contour plantation

5.18. Figure 18: Bench Terracing



5.19. Figure 19: Contour Vegetation Hedgerows



Source: Prof Dr Atul - Preparing, sketching 2D/3D designs

Alley Cropping

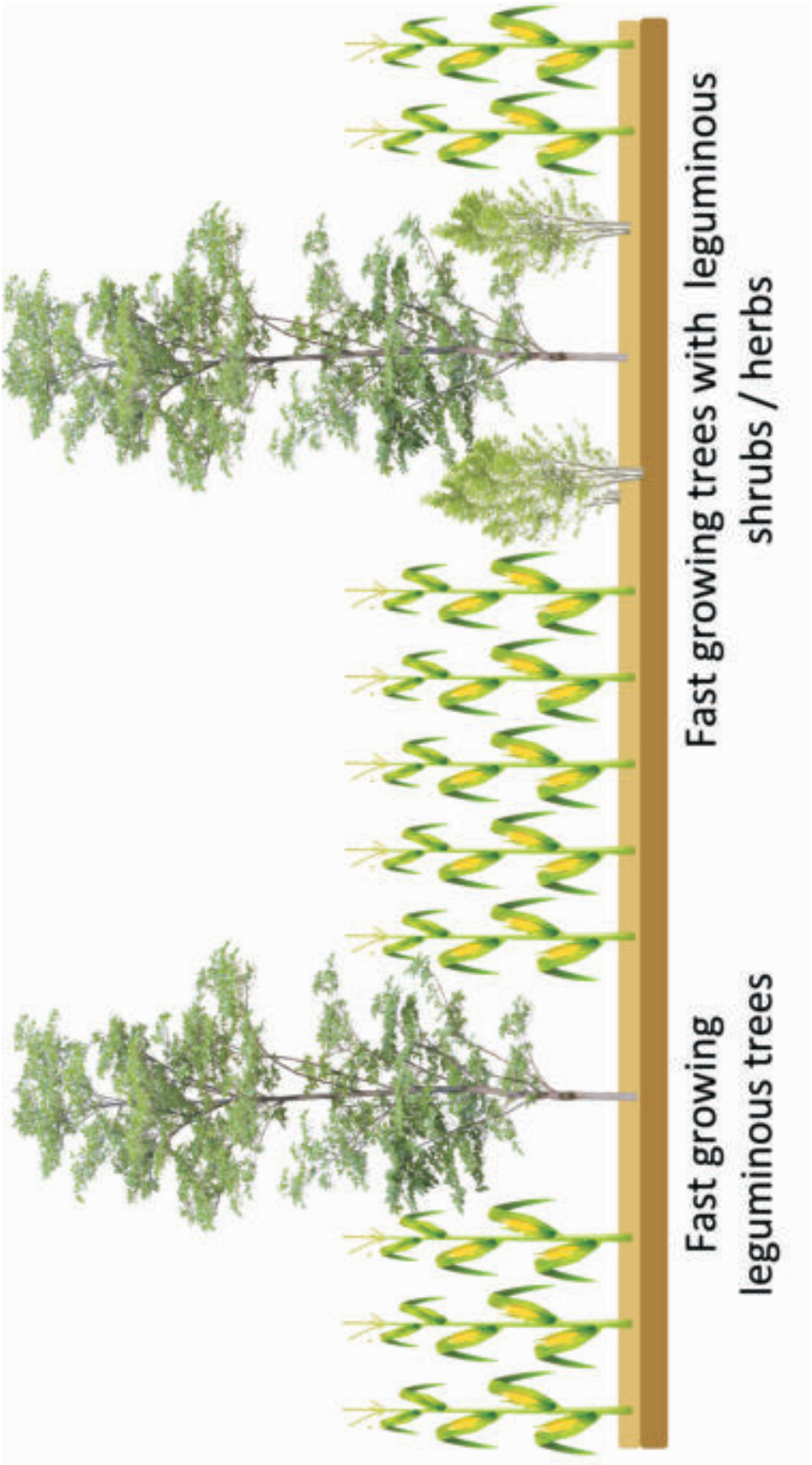
5.20. Figure 20: Alley Cropping

5.21. Figure 21: Improved Fallow

Source: Prof Dr Atul - Preparing, sketching 2D/3D designs

Under sowing

5.22. Figure 22: Under sowing



6. ICT Tools and applications in Agroforestry Extension

All the above stated practical exercises will be developed in the form of Google forms so that the data feeding, data analysing and report making becomes a part of automated application of the use of Information, Communication and Technology tools. However in order to make the trainees that how they can themselves use the ICT tools at their end a special feature of practice is added below:

6.1 Google Forms

Google forms is a free Google application that allows you to quickly create and distribute a form to gather information. Form responses are saved in a Google spreadsheet in Google drive.

Step 1.Open Google Chrome.

Step 2.Go to http://drive.google.com

Step 3. Enter your full UWW email address, then click next.

Step 4. Enter your UWW password, then click Sign in. You will now be signed into Google .

Drive. Step 5. Select New > More > Google Forms from the available menu. Choose either a Blank form or From a template.

6.2. Creating a New Form from Template or by using a Blank form

Step 1. The Template gallery General tab offers a number of form templates. Or, simply click on Blank form to start from scratch.

6.3 Editing your form

Step 1.Name the Form. Click the “Untitled Form” name in the top left corner of the screen, then enter the form's name. Hit the “Enter” key to submit your changes. If using a template, click on the template title to change to a unique name of your choosing.

Step 2. Form description: Enter the description by clicking on that field. When using a template, you may find stock text in this field. Highlight and delete to replace with your description.

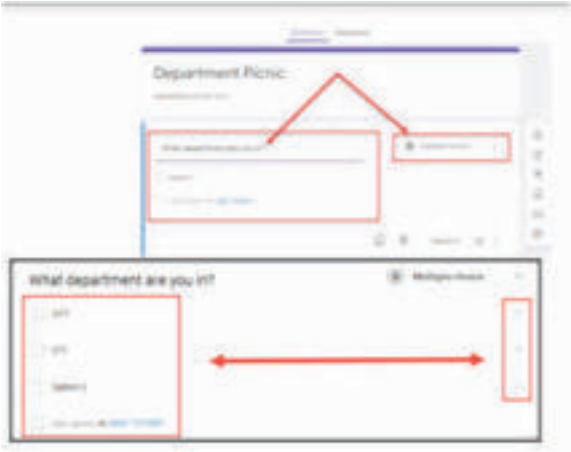
6.4. Edit Questions

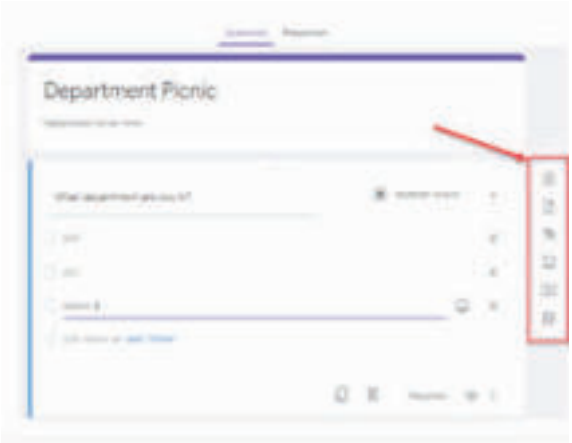
Step 1. Select “Untitled question” to enter your first question text. Step 2.Use the dropdown to the right of the question to select the question type. Step 3. Select each option to enter option text. Step 4.Hit the “Enter” key to create a new option. Note: Click the X to the right of each option to delete that option. Note: Click the Add Other link to add an “Other” option to your list.

6.5. Add Questions to the Google form

Step 1.Use the question toolbar to the right to add a new question, insert a new title and description, inset a picture, insert a video, or add a new section.

Step 2. Follow the steps above to edit the new question.





6.6. Copy/Duplicate Question

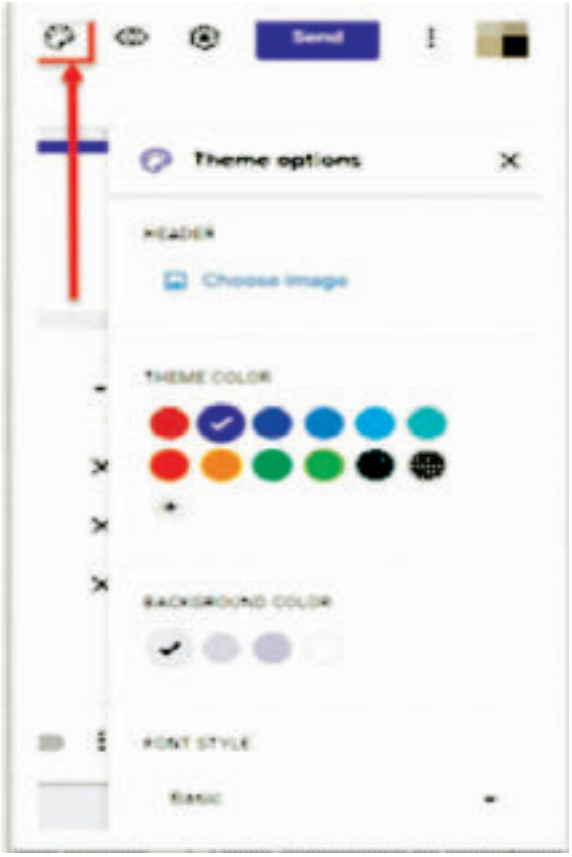
Copying a question allows you to quickly add a new question with the same format as your current question.

Delete Questions The delete button allows you to delete the selected question and options from the list.

Required Questions Select the "Required" button to make a question required.

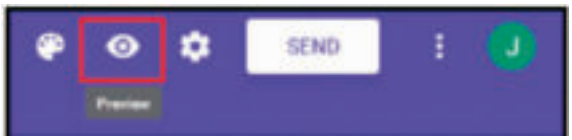
More Button The (More) button allows you to shuffle the order of questions and go to a new section based on a question answer.

Form Colours /Themes You can change the form colour or theme by clicking the (Colour Palate) button in the top right corner of the page. Click the button to select a header image on a theme or upload your own.



6.7. Preview Form

Click the "Preview" button to open a new browser tab with a final view of your form. Close out of that tab to return to the "Edit Form" view to make changes.



6.8. Advanced Form Settings

Click the (Settings) button to customize your form.

General Tab: Allows you to restrict users from your form,

collect email addresses of users filling out your form, limit 1 response, *etc.*

Presentation Tab: Allows you to display a progress bar, shuffle question order, and submit another form response. You can also modify your confirmation message once a user submits a form.

Quizzes: Allows you to set this form as a quiz, set grade options, *etc.*

6.9. Send Form

Click the Send button to view different ways to distribute your form.

Copy Form Link: Click the "link" icon to display the Form's URL link. Select the Shorten URL option to display a short link option.

Click the Copy link in the bottom right to copy the link.

Social Media: Click any one of the social media icons to share the form link using a social media platform.

6.10. Viewing Responses

Click the Responses tab to view user responses to your form.

6.11. Summary

Shows a pie chart percentage of responses for each question.

Individual: Displays each form response individually. Click the < or > button to move between each response.

Spreadsheet View: Click the (Create Spreadsheet) icon to create and view form responses in Google Sheets. Select to create a new spreadsheet or add to an existing spreadsheet.

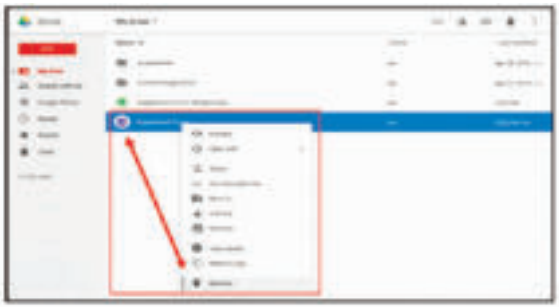
Once a spreadsheet is created, click the again to open the spreadsheet. Note: If you wish to be notified of any new form submissions, select Tools > Notification Rules from the Google Sheet menu. Select your notification preference, then click Save to save your changes.

6.12. Close Form

You can close the form for submission by selecting the Responses tab, then clicking the Accepting Responses toggle. You can modify the message respondents will see if they try to access your form while it is closed. Click the toggle again to reopen your form.

6.13. View Form and Form Responses is Google Drive

To edit your form or view your form response spreadsheet, go to Google Drivem then select your form. Use the search box at the top of the page to find your form if the form was saved in a folder.



6.14. Delete Form

To delete your form completely, locate your form in Google drive, right click on the form name, then select Delete. You may also delete the form responses by following the same steps. Note: Use the search box at the top of the page to locate your form if you cannot find it on your main Google drive page.

6.15. Analysing the responses

Once you create your questionnaire then it will appear in 'My Drive' in your Google Drive homepage. Once respondents start filling in the questionnaire the number completed will appear in brackets adjacent to the 'Form' option on the menu bar. This Form options includes: Edit form, Send form, Go to live form, Embed form, Show summary of responses, Accepting responses and Delete form. To see what form respondents will see go to 'live form'. To see a graphical representation of the results then select 'Show summary of responses' from the Form list.

7. Initiatives of GOI for development of Agroforestry

7.1. Project State UP and Karnataka list of Trees Species free from Felling and Transit

Government of India Ministry of Agriculture, Cooperation & Farmers Welfare Department of Agriculture, Cooperation & Farmers Welfare (Natural Resource Management Division– SMAF) notified vide F.No. 10-2/2020-NRM-SMAF Government of India the State wise list of Trees Species free from Felling and Transit Regulations growing on Non forest area /private land in following States and UTs as received from MoEF& CC.

S.No.	Name of States/UTs	Status
1.	Karnataka	Acacia hybrid, *Acacia mangium*, Tree of Heaven, Rain tree, All Cassias except Golden Rain tree, Cashew, Christmas tree, Arecanut, Casuarina, India Beef wood, Lemon, Orange, Coconut, Coffee, Mayflower, Indian coral tree, Eucalyptus, Glyceridia/ Quick stick, Silver Oak, Rubber, Jacaranda, Sausage tree , Subabul, Umbrella tree, Sapota/Chikoo fruit, Melia, Indian Cork tree, Drumstick, Mulberry , Curry leaf tree, Peltoform, Purple bauhinia, Pagoda tree, False Ashoka, Guava, Sesbania, Hummingbrid tree, Paradise tree, African tulip , Tabebula, Trumpet tree
2.	Uttar Pradesh (U.P.)	Aru, Casuarina, Jangal Jalebi, Poplar, Babool, Vilayati Babool, Rabania, Siris, Su-babool, Kathber, Jamun, Eucalyptus, Dhak Palas, Paper Mulberry, Ber, Sainjana, Shah toot, Mango (Desi, Tukhmi or Kalmi)

7.2 Other State wise list of Trees Species free from Felling and Transit

S.No.	States/UTs	Status
1.	Andaman and Nicobar Islands	Transit Permit is required for transit of forest produce in A & N Islands and no exemption for any sps. has been provided in the Regulation.
2.	Assam	No Felling Permission (FP) is required for home grown bamboo. No Transit Pass (TP) is required. Certificate from Gram Panchayat is required.
3.	Andhra Pradesh	NO FP. All spp exempted. NO TP, Allspp exempted.
4.	Arunachal Pradesh	No FP is for bonafide use except commercial use No TP is required except commercial and other use
5.	Bihar	Tree sps currently exempted from Transit Regulations (as on 27.02.2009) Poplar, Eucalyptus, Kadamb, Gamhar, Mango, Litchi, Toddy palm, Khajur, Bamboo sps (Except Dandrocalamusstrictus), Semul. Some more sps are in process to be exempted.
6.	Chandigarh	No interstate transit permit is being issued by Forest Department as no forest check posts have been established. The permission for felling of trees on private /non forest land is given only in two cases, i.e either for any development work or trees are dangerous to human life or property. As such no tree sps. is exempted under this.
7.	Chhattisgarh	Timber Sps that have been exempted from transit regulations are Poplar, Casuarina, Su-babul, Israili babul, Vilayati babul, Manzium ,Nilgiri
8.	Delhi	Since land is premium commodity in Delhi, farmers generally do not practice agroforestry here. Sps. Like Poplar, Kikar and Eucalyptus have been proposed for exemption. So FP is required There is no transit rules in Delhi for transportation of timber.
9.	Goa	No FP. Omitted Bamboo from the definition of tree. NO TP. All types of bamboo grown in private areas (non forest areas) will not fall under the purview of forest produce and hence transit permit for bamboo felled from private areas are exempted
10.	Gujarat	Nilgiri, Subabul, Saru, Champa, Laxmanfal , Ramfal, Sitafal, Asopalav, Pendula, Nagkesar,Nagchampha, Falsa, Ingorio/Angarea, Kamrakh, Kadhipatta, Limbu, Chikotru, Bijoru/Turanj, Narangi, Mausambi, Maharuk, Rukhdo, Motoarduso, Limdo,Neem, Bakan, Bakan, nim, Irani nim, Nimbara, Limbara, Mahanim, Mahogony, Bordi, Bor, Khati bor, Ghulbor, Liehi, Lilchi, Aritha, Aritha, Amba, Kadvo Saragavo, Saragavo , Agathin, Segto, Agastin, Desi Baval, Goras amlili, Gando baval, Ganda baval , Botlle Brush, Jamphal, Dadam, Chikoo, Boralli/Mursal/Vakal/Varasd/Bakul,

		Saptaparni, Champo, Safed champo, Liar/Nani/Gundi/Nagod, Nirgund/ Nargundi, Lingur Nirgudi, Ambla, Fanas, Pipli/papri, Shetur, Haredo, Harero, Poplar, Golden cane palm, Oilplam
11.	Himachal Pradesh	Kala Siris/Ohi/Sriris, Kachnar/Karial, Safeda, Kimu/Chirmu/ Shahtoot/ Tut/Mulberry, Poplar, Indian Willow/Biuns,Kuth, Kala Zira, Japanese Shehoot/paper mulberry, Paik, /Koi/Kosh/Kunis/ Kunish/Nyun, Khirk/ Khadki, Darark/Bakin, Fagoora/Phagoora/Tiamble/timla/tirmal/anjiri/ cluster fig/goolar, Toon, Jamun, Teak/Sagun/Sagwan, Arjun, Semal, Shalmaltas, Bihul/Beul/Bhimal/Bhiuna/Dhaman, Paza/Padam, Kamala/ Raini/Rohan/Rohini/Sinduri, Aam(Mango wild variety), Rishtak/Ritha/ Dode
12.	Haryana	Some sps are exempted from regulations under Punjab Land Preservation Act, 1900. These are Eucalyptas, Poplar, Alianthas , and Acacia tortilis. There is no transit rules applied for timber sps.
13.	Jharkhand	Eucalyptus (Safeda), Poplar, Casuarina, Maha Neem, Baken Kadmb, Subabool, Silver Oak, Israeli Babool Vilayati Babool, Babool, Plam, Ber, Munga, Mulberry Guava, Nimboo, Santra, Mussambi, Ashok,
14.	Jammu & Kashmir	Kikar, Bel, Siris, Champ, Neem, Malugarh, Kakrad, Palas, Amaltus/Karangal, Sisoo/Tali, Dhamman, Nili Gulmohar, Akhrot (khod), Kehbaljhingar, Baronkal, BilatiKikar, Safeda, Poplar, Robin, Chitta banddha, Rondu banddha, Sagwan, Arjun, Beheda, Tun/Toon, Bana, Dhoi
15.	Kerala	Species for Ply wood: Vellappine,Kurangandi/Narivenga/Mundani, Karakily/Kalpine, Kulamavu/Kulirmavu/Ooravu, Pali/Palendinjan, Thellipine/Undapine, Kulavu, Red Cedar, Poon/Punna/Punnappa, Vediplavu/Mullampali, Charu, Pothundi/Perunthondi, Cheeni, Nedunar, Vallabham/Varangu, Chorapine, Chemmaram, Champakam, Cherukonna, Mulliam, Neeramruthu, Peenary, Kumbil, Veembu, Gnavel, Kattunelli, Vakka, Thavala Species for Matchwood: Aspin/Kanala/Nasakam, Elavu/Poola, Pala/Mukkampala, Species for Bobbin wood : Vellakil, Manjakdambu, Species for pencil wood: Venkotta, Perumtholi/Poochakadmbu, Attuthekku/Cadambu, Species for packing wood: Kara/ Bhadraksham, Amazham,Aval, Arayanjili, Kalaveppu/Malaveppu, Vatta/Uppathi, Fire wood: Palvu (Jack), Parankimavu (cashew), Kattadi (Casuarina), Poovarasu (Poovarasu), Mavu (Mango tree), Puli (Tamarind tree), Nattupunna (Nattupunna), Aanjili (Aanjili), Vaka (Vaha- species), Poovam, (Poovam), Konna), Thanni (Thanni), Uthi (Uthi), Aal Jatikal (Ficus species), Matti (Matti), Murukku (Murukku), Elappu (IIoia) and Kodamuli (Koadampuli)
16.	Lakshadweep	NO FP. IFA or any Forest Act is not enforced in Lakshadweep. Also, Bamboo is not grown anywhere in Lakshadweep. Therefore amendment in IFA or any Forest Act does not arise in this state. No TP
17.	Madhya Pradesh	Neelgiri, Casuarina , Poplar, Subabul, Israili Babul, Vilayati Babul, Australian Babul, Babul, Khamer, Maharukh, Kadamb, Cassia Siamea, Gulmohar, Jacaranda, Silver oak, Plam, Ber, Mulberry , Katahal, Amrood, Nimbu, Santra, Mussambi, Munga, Molshri, Ashok, Putranjiva, Imli, Jamun, Mango, Saptparni, Kaitha, Jungle Jalebi, Petltaphorum, Neem, Bakain, Sissoo, Karanj, Palash, Safed Sirus, Pipal, Bargad, Gular, Rubber, Semal, Kapok, Chirol, Gliricidea, Rimjha , meithi Neem, Gurhal, , Jasoun, Conifers , imported Timber Species
18.	Maharashtra	Nilgiri trees, Babhul, Subabhul, Prosopis, Ashok, Drumstick, Sindi, Orange, Chiku, Bhendi, Acacia, Poplar, Lac, Casuarina equisetifolia, Rubberwood
19.	Meghalaya	Meghalaya being a Hilly state, there is no Agroforestry at all, since percentage of states land covered by agriculture is very small. If any blank interstate movement of timber is permitted, state will lose meagre resource of forests under control of the State Government.

20.	Mizoram	Kothal, Tung, Eucalyptus spp. ,Mulberry, Neem, Rubber tree, Imli, Silver Oak, Subabul, Mango, Guava, Coconut, Citrus, Areca nut 22. Manipur No Felling Permission (FP) is required No Transit Pass (TP) is required for home grown within state. TP is required outside state
21.	Nagaland	Aam, Korei, Walnut, Neem, Alder, Manipur Sim, Kadam, Hollock, Khokan, Teak, Gamari
22.	Odisha	Bada chakunda, Sana Chakunda, Jhaun, Sliver Oak, Patas/Nilgiri, Sunajhari/ Acacia, Subabul, Kaitha, Ambada, Batapi, Oau, Sajana, Karamanga, Sahada, Plam tree, Debadaru, Bhersunga, Gohira, Giliricidia, Paladhua, Coconut
23.	Punjab	"forest produce" shall specifically mean timber (converted or otherwise), firewood, charcoal, katha and resin, but shall not include Non Timber Forest Produces (NTFPs) like bamboos and agro-forestry species such as Populus spp., Eucalyptus spp., Melia azedarach (Drek), Morus alba (Mulberry), Leucaena leucocephala (Subabul), Casuarina spp., Grevillea robusta (Silver Oak), Acacia mangium, Melia dubia (Malabar Neem), Prosopis cineraria (Khejri), Salix alba (Indian willow), Gmelina arborea (Gamari) or any other species declared by the State/ authorised agency as agro-forestry species from time to time.
24.	Rajasthan	Casuarina, Australian babul, Khamer, Caaia Siamea, Gulmohar, Jaccaranda, Silver oak, Plam, Ber, Mulberry, Katahal, Amrood, Sehjana, Molshri, Ashok, Putranjiva, Imli, Jamun, Saptarni, Kaitha, Jungle Jalebi, Petaphorum, Bakain, Karanj, Safed Sirus, Semal, Kapok, Churel, Mithi neem
25.	Sikkim	No permission for felling of trees on any private or Forest land has been granted. If anyone wishes, he have to apply to Block Officer.
26.	TamilNadu	Mesquite, Casuarina, Subabul, Palmyrah, Dadops, Umbrella thom, White Back Acacia/ Panicled Acacia, Maharuch, Maharukh/East India Walnut/Siris, Cashew, Kadam, Jack, Neem/Margosa, Red silk cotton/ Kapok, Sappan, Cassia, white silk cotton tree/kapok, Sissoo, Coral tree, Eucalyptus, Gamari, Rubber, Sea Hibiscus, Mohua, Mango, Persian Lilac, Malabar Neem, Morinda /Suranji, Manila/ Tamarind, Pongam/ Indian Beach, Rain tree, Mahogeny, Jamun/Indian cherry, Tamarind, Esperanaza, Indian Portia tree/Indian Tulip, Red Cedar/Toon, Silver Oak.
27.	Telagana	(i) Eucalyptus, Neelagiri, Jama oil (ii) Casurina, Sarugudu, Sarvi, Saru(iii) Poplar(iv) Subabul (v) Israeli Babool (vi) Seema, Thumma(vii) Australian babul (viii) Gummaadi teak (ix) Pddamanu (x) Kadamb, (xi) Seema/ Tangedu (xii) Jacaranda (xiii) Silver oak (xiv) Regu, Ber(xv) Mulberry (xvi) Jama, Guava (xvii) Orange and related species,(xviii) Munga (xix) Ashok/ Naramamidi (xx) Mahaputrajivi/Putrajeevi (xxi) Edakulapala (xxii) Turakavepa (xxiii) Kanuga (xxiv) Rubber / Seemamarri (xxv) Tella Tumma (xxvi) Gliricidea/Seema/Kanuga (xxvii) Tella Tumma (xxviii) Kaivepaku (xxix) Mandara (xxx) Conifers(chir, Kail, Deodar, Pine species) (xxxi) Tati, Tadi, Palmyrah (xxxii) Sapota (xxxiii) Coconut, Kobbari, Tenkai, (xxxiv) Cashew, Jeedimamidi (xxxv) Semma, Chinta, (xxxvi) Raintree, Nidragannreru, (xxxviii) Mango, Mamidi (xxix) Panasa, Jackfruit
28.	Tripura	Tree species like Mango, Litchi, Drumstick, Guava, Rubber and bamboo are exempted from extraction from private land. Bamboo sps. have been exempted from transit permits both from Private and Forest land. Transport of Timber is also permitted.
29.	Uttarakhand	27 tree species have been exempted from the provision of Tree protection Act, 1976. This includes fodder and small timber species that are being used in small scale industries, animal husbandry, agricultural implements and allied activity. Other 07 tree species like Walnut , Neem, Oak , Ficus (Peepal and Banyan) and Deodar have been placed in the restricted category and felling permission can be granted only in case of dead or dangerous trees.

Annexures: Backup support materials

A. Production potential of the selected tree species

S.No.	Species	State	Status and presence of the species	Potential Production
1	*Melia dubia* (Melia) c-19	Karnataka and Uttar Pradesh	Introduced and emerging	15 cu.ft/tree 6X6m -14 years 120-140 kg biomass/tree 5X4m -6-7 years
2	*Santalum album* (Sandal)	Karnataka	Native and predominant	15.5-33 kg heartwood/tree- 25 years
3	*Populus deltoids* (Poplar) c-22	Uttar Pradesh	Predominant	150-200 kg biomass/tree - 5 year - 5x4m
4	*Emblica officinalis* (Aonla)	Karnataka and Uttar Pradesh	Native and predominant	120 kg fruit/tree - 10 year
5	*Azadirachta indica* (Neem) c-7	Karnataka and Uttar Pradesh	Native and predominant	10-25 kg fruit/tree - 12 year
6	*Pongamia pinnata* (Karanj)	Uttar Pradesh	Native and predominant	25-40 kg seed/tree - 7 year

B. Photo of Malabar Neem (*Melia dubia*) in Agroforestry System

C. Photo of Poplar (*Populus deltoides*) in Agroforestry System

D. Photo of Sandal (*Santalum album*) in Agroforestry System

E. Photo of Aonla (*Emblica officinalis*) in Agroforestry System

F. Photo of Karanj (*Pongamia pinnata*) in Agroforestry System

G. Photo of Neem (*Azadirachta indica*) in Agroforestry System

H. Brief details of the POPs developed for six agroforestry tree species

Malabar Neem (*Melia dubia*)	
Soil and Climate	Can be grown in varied type of soil type, fertile and sandy loam soil results in better growth while shallow gravelly soils shows somewhat stunted growth, temperature tolerance range 27.5 to 35.5 0C, performs well where mean annual rainfall exceeds 1000mm.
Improved clones	MTP-1, ICFRE Clone -4, 5, 6, 7, RC-01 to RC-59
Propagation	Seeds, stem cutting/coppice shoot cuttings (1000-2000 ppm)/mini clonal technology
Planting distance/ system	5 m x 5 m or 8m x 8m, square system, paired row
Manures and fertilizers	Apply N P K mixture of 25-50 g/tree twice a year whereas once in three month interval for first three years
Irrigation	10-15 days interval during non-rainy season
Special practices	Tending operations (ploughing, weeding), mulching
Suitable AFS	Groundnut, chilli, turmeric, papaya, banana, melon, foxtail millet, sugarcane
Harvesting	For timber -15 years; For pulp (4-6), and plywood 5-7 years
Pests	Red spider mite (Derrima 0.3 ml/l), Mealy bug (Neem oil)
Disease	Root rot (Ganoderma lucidum), Stem and twig canker
Utility	Packing cases, ceiling plank, agricultural implements, match boxes, musical instruments, tea boxes
Yield	15 cu.ft/ tree 6X6m -14 years; 120-140kgbiomass/tree 5X4m -6-7 years
Poplar (*Populus deltoides*)	
Soil and Climate	Generally requires sub-tropical climate, grow in areas having mean minimum and maximum temperature of 60C and 450C, respectively, and springs must be free from late frost. It grows on a wide variety of soils, but performs best on deep, fertile, clayey loam, sandy loam, alluvial loamy soils rich in organic matter. Well drained soils having pH between 5.8 and 8.5 and adequate moisture are

	considered best for its growth. tolerates frost and waterlogging, but is susceptible to fire
Improved Clones	G-48,Udai, W-22, W-32, W-39, A-26, S-7 C-15, S-7 C-8
Propagation	Seeds and Cuttings
Planting distance/ planting system	5 m x 5 m, 4 m x 5 m, 5 m x 4 m, 7 m x 3.5 m, 8 m x 2.5m, Square as well as rectangular planting methods are adopted , January/February is the best period for transplanting poplars from nursery to the field in northern India
Manures and fertilizers	2 kg FYM, 50 gm SSP, and 25 gm MOP which is increase slightly year after year, Application of fertilizer must be followed by light irrigation. If the soils are deficient in zinc, zinc sulphate at 25 kg/ha should be applied.
Irrigation	Irrigation should be light and the interval may vary between 7 and 10 days depending upon the type of soil
Special practices	Weeding, mulching, training and pruning
Suitable crops	Wheat, mustard, turmeric, ginger, colocasia, cabbage, potato, spinach, garlic, citrus, guava, mango
Harvesting	In India, usually harvested at a target diameter of 24 cm dbh
Pests	Stem borer (para-di-chloro-benzene in kerosene oil or carbon disulphide), Termites (Chlorpyriphos (0.2%) or Endosulfan (0.2%) in water solution)
Disease	C. Salmonicolor (0.2% Dithane-M-45 + 0.1% Bavistin), M. ciliate (Copper oxychloride (0.2%)/fortnight)
Yield	150-200 kg biomass/tree - 5 year - 5x4m
Uses /utilization	Match industry, plywood, fuelwood, excellent source of fibre for various grades of paper (fine paper, packing paper and newsprint).
Sandal (*Santalum album*)	
Soil and Climate	It grows well in red sandy loam soil. The tree flourishes well in different types of soil like sandy, clayey red soils, lateritic, loamy and even in black cotton soils. Trees growing on stony or gravelly soils are known to have more highly scented wood. It grows best where there is moderate rainfall of 600 to 1600 mm. It grows well in early stages under partial shade but at the middle and later stages shows intolerance to heavy overhead shade. Crop requires humid & hot climate.
Propagation	Seed, air layering or through root suckers
Planting distance/ planting system	2.5 to 4 meters, square system
Host	Cajanus cajan, Alternanthera sessilis (L.) R. Br. ex. Dc, Cassia fistula L., Mimosa pudica - Immediate Host
Suitable intercrops	Depending on the secondary host, crops like legumes are generally grown
Irrigation	It is a rainfed crop. Young plant requires watering in summer months at 15-20 days interval till they are fully established
Special practices	Weeding, thinning
Harvesting	Sandal wood trees are harvested at the age of 30-60 years. The soft wood is first removed; the hard wood is chipped and then converted into powder in a mill. The powder is soaked in water for 48 hours and then distilled. Distillation takes place in 48 hours. The oil is rectified by re-distillation and filtration
Yield	Sandal is considered to be a slow growing tree. It grows at the rate of 5 cm. of girth or more per year under favourable soil and moisture conditions. The heartwood formation starts around ten years of age. Yield of heartwood with 1 kg reaches after 10 year, 4 kg in 20 years, 10 kg in 30 years and 20 kg in 40 years.
Pests	Stem borers Zeuzeracoffease Nietn (red borer) Indarbelaquardinotata Walker (bark-feeding caterpillar) and Aristobiaoctofasiculata Aurivillius (heartwood borer)
Disease	Spike disease,
Uses	Oil used for various purposes

Aonla (*Emblica officinalis*)	
Soil and Climate	Grown in varied type of soil (light & heavy), well drained fertile loamy soil is the best for its cultivation, marginal degraded lands. Tolerate acidic to saline/sodic (pH up to 9.5, ESP-35 & ECe-6-9 dsm-1) soils. adapted to varied habitat and agroclimatic conditions (subtropical, tropical, arid, semi-arid conditions), tolerate freezing as well as high temperature of 480C,
Improved Varieties	NA-4, NA-5, NA-6, NA-7, NA-9, NA-10, Anand-1, 2, BSR-1, 2, Goma Aishwarya, Laxmi 52
Propagation and rootstock	Patch budding (May to September), soft wood grafting and ring budding (semi-arid region)
Planting System	Pits (1m x 1m x 1m size), May month at 8 m x 8 m or 10 m x 10 m,
Manures and fertilizers	A dose of 15 kg FYM, 100 g N, 50 g P and 100 g K should be given to one year old aonla plants and this dose of manures and fertilizers should gradually be increased every year up to ten years and thereafter, constant dose should be given.
Irrigation	Required until the young plants are established, during summer months irrigation at the interval of 15 days is recommended,
Harvesting	Maturity of aonla fruits can be judged externally by change in the fruit color from greenish to whitish green or yellowish green and change in seed color from creamy white to brown. Apart from it physiological maturity, aonla can be determined on the basis of specific gravity (1.07-1.24), fiber content, and TSS/ acid ratio (5 to 6).
Pests	Bark eating caterpillar (CM: Inject kerosene oil or petrol, dichlorvos and plug the hole with mud, foliar application with dimethoate (0.05%) at tri-weekly interval controls the overall pests effectively, alternatively followed by NSKE (5%) at 10 days interval
Disease	Rust, Anthracnose, Penicillium fruit rot
Post-Harvest Management	Grading (A, B & C), Post-harvest chemical and plant hormones spray, Packaging (wooden crates o with polyethylene bags as liners and CFB boxes)
Value Addition	Aonla fruits are commercially utilized for processing industries as murraba, candy, chatni, toffee, shreds, sauce, aonla pulp, powder, juice, laddu, supari, liquor, sherbet, *etc.*; ayurvedic medicines as chwanprash, trifla, syrup, diabetic powder, aonla powder and in cosmetic industries as shampoo, hair oil, dyes, etc
Karanj (*Pongamia pinnata*)	
Soil and Climate	It can grow even in dry areas with poor, marginal, sandy and rocky soils. However, it does not like very dry sandy or very wet clay soils. It flourishes best in deep sandy loams with abundant moisture. Besides being drought tolerant, it is also tolerant to salinity and alkalinity. The soil pH range for good growth is 6-9, wide range of climatic conditions (humid and sub-tropical environments), temperature range of 5 to 50°C and well distributed annual rainfall of 600-2500 mm are suitable for its growth
Propagation	Seeds, cleft grafting , Semi-hard wood cuttings
Planting distance/ planting system	Block planting (2m x2m, 5m x5m, 6m x 6m), for intercropping (3m x2m , 3m x 3m), avenue/boundary plantation (2 to 4 m), June-July
Manures and fertilizers	5 kg FYM, 20 gm Urea, 120 gm Single superphosphate and 60 g Muriate of Potash (MOP) should be applied
Irrigation	Irrigation once in a month during the dry period will enhance growth and productivity.
Special practices	Weeding, training and pruning
Suitable crops for agroforestry system	Cow pea, cluster beans, dhiancha, mung bean, ocimum
Harvesting	Harvesting for seed start after attaining the age of 4-7 years
Pests	Leaf minor (monocrotophos 0.01%), Galls (dimethoate 30 EC @ 1ml/l)

Disease	Leaf spot, Rust, anthracnose (carbendazim 2g/l or dithane-Z-78 @2g/l)
Uses /utilization	Leaf: fodder for cattle and goats Timber: cartwheels, agricultural implements, tool and combs Wood: fuelwood Seed oil: soap making, fuel, lubricants, use to cure skin disease
Yield	25-40 kg seed/year (medium sized tree of 7 years and later 50 kg /year)
Neem (*Azadirachta indica*)	
Soil and Climate	It grows on wide variety of deep or shallow soils ranging from sandy soils, black cotton soils, but does not survive on waterlogged, highly saline or deep dry sand. It also thrives better than other species on dry, stony, clayey and shallow soils. It can also come up on soil, where there is hard calcareous or clay pan just below the soil surface. Tropical/sub-tropical and drought resistance plant which grows well in sub-arid to sub-humid conditions with 400 -1200 mm annual rainfall, temperature tolerance range 4 to 42.5 °C
Propagation	Seeds, cuttings, air layering, cuttings, grafting and tissue culture
Planting distance/ planting system	5 m × 5 m, square system
Suitable Agroforestry Systems	groundnut, mustard, chickpea, cowpea, horse gram and soybean
Irrigation	Required for initial plant establishment
Special practices	Weeding, training and pruning
Harvesting and yield	Fruit yield is 10-25 kg per tree per year in the initial years. A mature tree produces 30-100 kg fruit per year. It has been estimated that a 10-year-old tree can yield 5-6 cu ft of timber
Pests	Tip borer (*Laspeyresiakoenigiana*) and tea mosquito bug (*Heliopeltisantonii*) attack seedlings and young plants. Pulvinaris maxima is a scale insect now regarded as a key pest and *Heliothripshaemorrhoidalis* a potential pest of Neem.
Disease	Damping-off, Rhizoctonia leaf web blight, leaf spot and blights induced by *Colletotrichum* sp., *Alternaria* sp. and *Pseudocercospora* sp

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