



FOREST PLANT NURSERY

Introduction

Nursery may be referred as a place where plants are grown for transplanting, for use as stock for budding and grafting, or for sale. Plants are commonly grown from seed or from cuttings i.e. Vegetative propagation and are often grown in pots or other temporary containers.

- Nurseries are used for artificial plantation. It may be established in areas with less plant regeneration.
- Nurseries are raised to get plants of the right size at the right time.
- Nurseries are also raised to have healthy and long lasting plants.
- Plants are maintained in the nurseries in the initial growing period so as to be able to grow plants free from various fungi and bacterial attacks that generally occurs in the initial period.

A forest nursery is an area which is managed to grow seedlings in favourable conditions until they are ready for planting. It can be informal, a small settlement, or a large enterprise. Farms vary in size, configuration (materials, tools, equipment, etc.), the types of seedlings to be planted, and the farming business.

Market Potential

One of the main objectives of establishing a nursery is to promote plantation. Forest nurseries are generally developed for regeneration of forest and development of varieties of trees in a healthy condition under favourable conditions. Demand for these forest plants also hike due to the timber obtained from such trees after it grows to a certain level.

Since government and non-government organisations are focusing on the development and regeneration of forests, the market of forest nursery gains an opportunity to expand.

Product Uses

- Various organization take plants from these nurseries as a part of their afforestation activities.
- Forest plants are used in regeneration of forests.
- Plants grown in forest nursery are generally used to plant along roadside.

Assumptions

I. Model DPR has been prepared based on following assumptions:

- Land: 1.5 acres of owned land has been taken for establishing the forest plant nursery.
- Selection of site: Site of establishing nursery has been selected taking into consideration that area is connected with road so as to facilitate transportation.
- Water supply: A good irrigation facility being a pre requisite for establishing a commercial nursery, the nursery has a reliable and adequate water supply connection throughout the year.
- Availability of soil: The nursery bed will be prepared by adding soil, sand and manure in the ratio 2:1:1 with an ideal ph. between 5.5 to 6.5. An appropriate source of soil, i.e., forest soil, as well as sand is located within the reach of the farm. Symbiotic organisms (mycorrhizae and rhizobia) will be present in the soil, as most trees grow better when their roots need to be connected to specific symbionts that will help them in their nutrition. In most cases, of course, these organisms have been discovered, but in some cases, artificial vaccination is necessary.
- Mechanism: Seedlings are first grown in the mother beds and then transferred to the poly sheets.
- Power: Even though the power requirement is less, regular power supply plays a very important role since it is necessary for operating irrigation system and other ancillary works in the nursery, hence a DG Set of 20 KVA is taken.
- Manpower requirement: Forest plant nursery production is highly labour intensive where both skilled and semi-skilled labor are critical inputs. Therefore, timely availability of labour is ensured.
- Land Development: The Land development cost includes:
 - a. Land cleaning
 - b. Land leveling
 - c. Solidification
 - d. Water path making
 - e. Road preparation
 - f. Bamboo fencing

- Civil Works and Building: It includes:
 - a. Germination house
 - b. Shaded net area
 - c. Nursery office
 - d. Warehouse and workshop
- Preliminary and Preoperative period is 6 months.
- Digging the beds: Seedling beds are rectangular in shape having a length of 10 metre and width of 1.25 metre also a distance of about 45 cm is maintained between two beds.
- Forest nursery equipment: seedbeds, ploughs, harrows, cultivators, seeding and planting machines, irrigation systems, machines for packaging plants, background for workers, workshops, spaces for substrate preparation, halls for sorting and packaging of plants, storage rooms for chemicals etc.
- Other forestry plants: We have taken into consideration 5 variety of plants for forest plant nursery, however there are other plants also such as northern cedar plant, silver oak tree, oak, beech, maple etc.
- Principal Repayment and Interest on Term Loan: The principal amount has been repaid half-yearly and the interest on term loan has been charged quarterly.
- Working Capital in the form of KCC and interest on the same has been charged half-yearly.

II. Nursery Plants chosen for the DPR and its particulars:

Name of the Plant	Yearly Production (in units)
Agarwood plant	28000
Teak plant	8976
Eucalyptus plant	10880
Red sandal wood plant	23760
Forestry plant	48000

Agarwood plant

Agarwood plant is grown widely in the north eastern part of India. It is used making incense and perfumes as it produces aromatic resins. It is also called the Woods of the Gods. It is the infected wood of Aquilaria. Due to depletion of forest resources its cost is quite high. Ideal temperature for the growth of agarwood ranges from 20 degrees to 30 degrees Celsius and humidity ranging between 77-85%.



Teak plant

Teak grows as a huge tree and the wood quality is excellent, hence it has varied uses. It grows well on moist sites. To produce high quality timber trees, the site should be subjected to a dry period of 3-5-month duration. Soil required to produce teak saplings must be deep, well- drained, and alluvial with high calcium, organic matter and other element content. The soil pH is 6.5-7.5.



Eucalyptus plant

Eucalyptus plant requires a planting site that gets ample of sunlight and has soil with sharp drainage. Inter spacing in between two plants must be adequate. This plant also can be grown in both seed beds and pots. Seed once germinated into saplings can be transplanted. Eucalyptus is adaptable to most soil types, but it requires soil with good drainage. The plant is drought tolerant. Eucalyptus prefers warm temperatures between 65 and 75 degrees Fahrenheit, and it likes a moderate humidity level.



Red sandal wood plant

Red sandal wood tree is mainly used in carving, furniture also its timber is used in extraction of medicine and various cosmetic products. It is used for treating cough and cold, digestive problems and majorly for blood purification. Best time to grow this plant is mid of May to June i.e., In the onset of rainy season.



Forestry plant

Common forestry tree adapt well to the given environment and germination rate is quite high. before planting the seed, the seed needs to be soaked in cold water for 5-10 days. Saplings are produced within 10-15 days of planting in the seed bed and then it can be transplanted into the poly-sheet for sale.



Cost of Project

Particulars	Amount (Rs. In Lakhs)
Land (own)	0.00
Land development cost	15.00
Mother bed development cost	3.50
Civil works and Buildings	44.25
Plant and machinery	3.05
Miscellaneous Fixed Asset	1.35
D G Set (20 KVA)	2.40
Escalation & Contingencies (2%)	1.39
Preliminary & Preoperative Expenses	10.20
Sub-total (A)	81.15
Working Capital Margin @25% of Total WC Requirement	0.75
Total Project Cost	81.90
Total Working Capital Required (B)	3.00
MEANS OF FINANCE	
Total Funds Required (A+B)	84.15
<u>Loan Component-</u>	
TERM LOAN (60% of A)	48.69
WORKING CAPITAL (75% of B)	2.25
Total	50.94
Equity	33.21
Total	84.15

Detailed Cost Element

Sl. No.	Particulars	Amount (Rs. in Lakhs)
1	Water Storage Tank (10000 Litre Capacity)	0.75
2	Irrigation Pump	1.25
3	Drip Irrigation Pipe	0.03
4	Micro Sprinklers	0.01
5	Pruning Saw	0.33
6	Budding and Grafting Knife	0.08
7	Garden Bill Hook	0.02
8	Garden Fork	0.03
9	Sickle	0.00
10	Crow Bars	0.05
11	Garden Pick Axe	0.04
12	Garden Digging Spade	0.02
13	Garden Rake	0.03
14	Hand Trowel	0.01
15	Axe	0.06
16	Wheel Barrow	0.32
17	Polythene Sheets	0.03
	Total	3.05

Contingencies and Escalations

It has been assumed at approximately 2% at cost.

Preliminary Expenses

Particulars	Amount (Rs. in Lakhs)
Incorporation Expenses	0.05
Project Report Preparation and Consultation	0.50
Legal Charges - Drafting for agreements, contracts, stamp paper, notary and affidavit cost	0.05
Security Guard and others	8.28
Interest Cost for period before commercial operations	1.32
Total	10.20

Salary

Designation	Manpower	Amount (Rs. In lakhs)
Agricultural technician	1	3.00
office staff cum accountant	1	1.80
skilled labour	3	3.60
Worker (contract basis)	4	2.88
security staff	2	2.40

Profitability Statement

Particulars	Amount (Rs. In Lakhs)				
	Year- 1	Year- 2	Year- 3	Year- 4	Year- 5
<u>A. INCOME</u>					
Production During the year	119616	128109	134514	141240	148302
Annual turnover	52.64	55.28	58.04	60.94	63.99
Total income during the year	52.64	55.28	58.04	60.94	63.99
<u>B. OPERATING EXPENSES</u>					
Raw Material	10.61	10.82	11.04	11.41	11.80
Salary	13.68	13.95	14.23	14.52	14.81
Repair & Maintenance	0.79	0.83	0.87	0.91	0.96
Power & utilities	0.46	0.47	0.48	0.49	0.50
Depreciation and Amortisation	5.07	5.07	5.07	4.81	4.81
Total Operating Expenses	30.62	31.15	31.70	32.15	32.88
Operating Profit (A-B)	22.03	24.12	26.34	28.80	31.11
<u>C. FINANCIAL EXPENSES</u>					
Interest on term loan	3.99	3.40	2.81	2.22	1.63
Interest on working capital	0.19	0.19	0.19	0.19	0.19
<u>D. Other Expenses</u>					
Administrative and general Expenses	0.79	0.83	0.87	0.91	0.96
Total Expenses	4.97	4.42	3.87	3.32	2.78
Profit Before Tax	17.05	19.70	22.47	25.47	28.33
Provision for Tax	4.26	4.93	5.62	6.37	7.08
Profit after Tax (PAT)	12.79	14.78	16.85	19.10	21.25
Dividend Declared	0.00	0.00	0.00	0.00	0.00
Retained Profit	12.79	14.78	16.85	19.10	21.25

Breakeven Point

SL	Particulars	Year - 1	Year - 2	Year - 3	Year - 4	Year - 5
A.	Net Sales	52.64	55.28	58.04	60.94	63.99
B.	<u>Variable Cost</u>					
	Raw Material	10.61	10.82	11.04	11.41	11.80
	Power and Utility	0.46	0.47	0.48	0.49	0.50
	Total Variable Cost	11.07	11.29	11.52	11.90	12.30
C.	Contribution (A-B)	41.57	43.98	46.52	49.04	51.69
D.	<u>Fixed Cost</u>					
	Salary	13.68	13.95	14.23	14.52	14.81
	Interest on term loan	3.99	3.40	2.81	2.22	1.63
	interest on working capital	0.19	0.19	0.19	0.19	0.19
	Repair & Maintenance	0.79	0.83	0.87	0.91	0.96
	Depreciation and Amortisation	5.07	5.07	5.07	4.81	4.81
	Total Fixed Cost	23.73	23.45	23.18	22.65	22.40
E.	Breakeven Point	57%	53%	50%	46%	43%
F.	Cash BEP	45%	42%	39%	36%	34%

Debt-Service Coverage Ratio

SL	Particulars	Year - 1	Year - 2	Year - 3	Year - 4	Year - 5
i	Profit	12.79	14.78	16.85	19.10	21.25
ii	Depreciation	5.07	5.07	5.07	4.81	4.81
iii	Interest on term loan	3.99	3.40	2.81	2.22	1.63
A	Total (i + ii + iii)	21.86	23.25	24.74	26.13	27.69
i	Interest on term loan	3.99	3.40	2.81	2.22	1.63
ii	Principal repayment	6.96	6.96	6.96	6.96	6.96
B	Total (i + ii)	10.95	10.36	9.76	9.17	8.58
	DSCR (A / B)	2.00	2.25	2.53	2.85	3.23

Interest on Term Loan and Principal Repayment

Refer Annexure I for Loan Repayment Schedule.

We have assumed the repayment tenure of term loan for a period of 7 years, rate of interest being @ 8.5% with the moratorium period being 6 months.

Address of Vendors

Name of Vendor	Address and Contact Number
Natural agency	Nagavali, Salem, India. Ph No.:08048413020
M/s Zinna enterprises	Nagaon, Guwahati Ph No.:08045328393

ANNEXURE - 1

Year	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Annually
I													
Principal													
Opening	48.69	48.69	48.69	48.69	48.69	48.69	45.21	45.21	45.21	45.21	45.21	45.21	
Repaid						3.48						3.48	6.96
Closing	48.69	48.69	48.69	48.69	48.69	45.21	45.21	45.21	45.21	45.21	45.21	41.73	
Interest			1.03			1.03			0.96			0.96	3.99
II													
Principal													
Opening	41.73	41.73	41.73	41.73	41.73	41.73	38.26	38.26	38.26	38.26	38.26	38.26	
Repaid						3.48						3.48	6.96
Closing	41.73	41.73	41.73	41.73	41.73	38.26	38.26	38.26	38.26	38.26	38.26	34.78	
Interest			0.89			0.89			0.81			0.81	3.40
III													
Principal													
Opening	34.78	34.78	34.78	34.78	34.78	34.78	31.30	31.30	31.30	31.30	31.30	31.30	
Repaid						3.48						3.48	6.96
Closing	34.78	34.78	34.78	34.78	34.78	31.30	31.30	31.30	31.30	31.30	31.30	27.82	
Interest			0.74			0.74			0.67			0.67	2.81
IV													
Principal													
Opening	27.82	27.82	27.82	27.82	27.82	27.82	24.35	24.35	24.35	24.35	24.35	24.35	
Repaid						3.48						3.48	6.96
Closing	27.82	27.82	27.82	27.82	27.82	24.35	24.35	24.35	24.35	24.35	24.35	20.87	
Interest			0.59			0.59			0.52			0.52	2.22
V													
Principal													
Opening	20.87	20.87	20.87	20.87	20.87	20.87	17.39	17.39	17.39	17.39	17.39	17.39	
Repaid						3.48						3.48	6.96
Closing	20.87	20.87	20.87	20.87	20.87	17.39	17.39	17.39	17.39	17.39	17.39	13.91	
Interest			0.44			0.44			0.37			0.37	1.63
VI													
Principal													
Opening	13.91	13.91	13.91	13.91	13.91	13.91	10.43	10.43	10.43	10.43	10.43	10.43	
Repaid						3.48						3.48	6.96
Closing	13.91	13.91	13.91	13.91	13.91	10.43	10.43	10.43	10.43	10.43	10.43	6.96	
Interest			0.30			0.30			0.22			0.22	1.03
VII													
Principal													
Opening	6.96	6.96	6.96	6.96	6.96	6.96	3.48	3.48	3.48	3.48	3.48	3.48	
Repaid						3.48						3.48	6.96
Closing	6.96	6.96	6.96	6.96	6.96	3.48	3.48	3.48	3.48	3.48	3.48	0.00	
Interest			0.15			0.15			0.07			0.07	0.44