
Bamboo Nursery

a. Introduction

Bamboo is a strong, fibrous plant with a variety of uses, it grows quickly and is relatively easy to propagate. There are three main methods of bamboo propagation. The most difficult method of bamboo propagation is growing it from seed. Most species of bamboo tend to flower and produce seeds only at the end of their lifetimes, if at all, and some species of bamboo can live up to 120 years. Flowering is unpredictable and inconsistent, which makes it challenging to collect seeds. Bamboo seeds have a short life, and must be kept under carefully controlled conditions to keep them viable. There are four main methods of bamboo propagation are

Methods of Propagation	Part of Bamboo	Ease of Propagation
Division	Root mass	Easily propagated
Rhizome cutting	Underground stem (rhizome)	Moderately easy
Culm burial	Stalk (culm)	Somewhat difficult
Tissue Culture	Tissue	Complicated but effective

b. Market Demand

Bamboo fulfils twin concerns of livelihood enhancement and environmental protection in Rural areas and it is the most frequently utilized material from Handicraft, food & housing components. To Provides material benefits and livelihood there is an opportunity to commercially cultivate bamboo in larger scale, for this purpose a large quantity of Bamboo Saplings is required. So, nursery is a place where Bamboo plants are propagated and grown to a desired age in a controlled environment and care. Supply of good quality planting material/Bamboo Saplings also can fetch a premium price.

c. Production Target

Bamboo nursery can be done in a very decentralised manner and can easily done by homebound women and those that are unable to do manual labour. The unit may be established on a small scale as private household businesses or on a larger scale as a cooperative or government enterprise. Small ornamental plant producing nurseries or existing govt. and private nurseries can also be targeted, as, bamboo nursery generates employment, especially for women and other disadvantaged groups, ensures better income distribution.

d. Assumptions, if any

The essential requirements for a successful unit are:

The site of a commercial Bamboo Nursery to be selected keeping into mind that; it's having a perennial source of water inside the nursery with minimum necessary shade and protection. Convenience of transportation of the saplings with minimum damage.

e. Production Process

a. Tissue Culture

- **Initiation phase.** It concerns the establishment of Bamboo plant tissue in vitro by sterilizing the material and initiating it into culture.
- **Multiplication phase.** At this stage, the in vitro plant material is re-divided and placed in a medium with plant growth regulators. This process is repeated many times until the number of plants desired is reached.

b. Hardening

- **Primary hardening.** At this stage rooted Bamboo Plantlets are carefully shifted from bottle to coco-pit medium and kept in a fan shed for primary hardening for 30 days.
- Then **Secondary hardening** for 90 days in Polly-bag containing soil medium of 20% farm yard manure, 40 % Soil, 40% Paddy Husk. Once the bamboo samplings are grown up to 1-1.5 feet the sales takes place

f. List of machinery required along with quantity with Unit Price.

Al though there is no proper size of the Bamboo nursery is defended but according to the different stages of operation and facilities a Bamboo nursery can be categorised as follows.

Type	Small	Medium	Large
Facilities	» Secondary Hardening » flowering/ ornamental plants (optional)	»Primary Hardening »Secondary Hardening	»Tissue culture »Primary Hardening »Secondary Hardening
Minimum Area Required	» 0.5 Acre	»0.5 Acre	» 0.75 Acre
Minimum Investment	» INR 15 Lakh	» INR 25 Lakh	» INR 75 Lakh

1. Financial Projection

Here is one sample financial projection of a medium types of Bamboo nursery; its demonstrates limited profitability, if it operates only one cycle/year and completely depends on bamboo saplings.

PARTICULARS	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Infrastructure, Irrigation, Fencing	4.23					
Tools & Equipments	0.25					
Planting material & pot mixture	4.50	6.00	7.75	9.50	9.75	37.50
HR & Utility	1.68	1.63	1.72	1.81	1.90	8.74

Labour cost	0.21	0.18	0.22	0.26	0.27	1.13
Total	10.87	7.81	9.68	11.56	11.92	47.36
Unit cost capitalised up to 3 year	28.36					
INCOME	Year 1	Year 2	Year 3	Year 4	Year 5	Total
No. of Sapling Prepared (in thousand)	0	30	45	60	75	210.00
Survival/success rate	NA	80%	80%	80%	80%	4.00
Saleable Saplings	0	24	36	48	60	168.00
Sales price per sapling	35	35	35	40	40	185.00
Income from sale of Saplings	0	8.4	12.6	19.2	24	64.20
PV of Benefits	0	7.7	9.72	13.6	15.6	46.62
EXPENDITURE	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Capital Expenditure	10.87	-	-	-	-	10.87
Recurring Expenditure (operational costs)	-	7.81	9.68	11.56	11.92	40.97
Repairs and maintenance	-	-	-	0.38	-	0.38
Total Expenditure	10.87	7.81	9.68	11.94	11.92	52.22
PV of Cost	9.97	6.57	7.47	8.85	7.74	40.60
Net Income	-10.87	0.59	2.92	7.26	12.08	11.98
Present Worth – Costs	40.60					
Present Worth – Benefits	46.62					
Net Present Worth	6.02					
BCR	1.14					
IRR	0.25					