

Title: Propagation of *Cinnamomum tamala* (Tejpatta) for conservation and livelihood.

Background: *Cinnamomum tamala* belonging to the family Lauraceae, commonly known as Indian cassia, Tejpatta and Indian bay leaf, is an evergreen plant found in sub-tropical Himalayan region. The tree can be small to medium sized with its height ranging from 2-12 m. The optimum temperature range for the growth of this tree is 25-35°C. Physical conditions like high relative humidity, evenly distributed rainfall and moderate temperatures are ideal for the voracious growth of leaves of this tree. Although this tree can be cultivated in a wide range of soils, the best suitable soil conditions are well drained black soils with a high percentage of organic matter content coupled with a pH range from 6.0 to 8.0. The bark and leaves of this tree are of medicinal importance. The leaves of this plant possess aromatic fragrance and are also utilized as flavouring agent. This plant species is an important ingredient of several Ayurvedic preparations such as Sitopaladi churna, Khadirarishta, Chandraprabhavati etc. Various phytochemical compounds isolated from this plant have many pharmacological activities viz. anticancerous, antidiabetic, antimicrobial, hepatoprotective, antidiarrheal and immunomodulatory. In Himachal Pradesh, it is present in Hamirpur, Tons valley in Shimla, Kangra, Chamba, Mandi, Solan, Nahan regions bordering U.P. and commonly found in Jogindernagar and Palampur area in specific localities. Keeping in view the common occurrence of this species, it is felt that if its propagation is initially undertaken in Jogindernagar, the same may easily be developed into a model site and replicated to other appropriate areas subsequently.

Scheme and Activities: The scheme includes identification of appropriate areas as per the availability of suitable soil and water source. Depending on the soil moisture and season, the irrigation in pit areas is required and the plants may need to be irrigated at least once a week in summers. In addition, Potassium acrylate will be used for moisture retention as per requirement in the field. CIGs of interested families will be formed to take up its propagation in the adjoining fenced forest plantation areas of VFDS. Marketing will be carried out by the marketing committee set up at Cluster level of VFDS and under the aegis of Manager (Marketing) from PMU.

Nursery raising technology:

- Preferred method of propagation through seed. Seed is collected locally from healthy plants in May-June and its viability is almost one year.
- The sowing of seed is done in nursery in March-April and the plants are ready for planting after one and half year.
- Seedlings appear 30-45 days after sowing and are transplanted in field in rows of 2-2.5 m apart with the spacing between the plants being 3-3.5 m.
- As far as land preparation is concerned, at least 2-3 thorough ploughings are necessary for making the field weed free as well as for obtaining fine filth of the soil. The remaining soil clods after these ploughings should be crushed manually by country ploughs since they favour germination. After opening up the top soil, the land is left for 15 days in the sun for sun-drying. This will ensure the elimination of weeds and potential weed seeds.

Planting

- The planting is done in (60x60x60) cm size pits in July- August.
- Irrigation is not required since the areas where this plant grows receive plenty of rainfall which is enough for meeting water requirements of the plant. However, in extremely dry areas and areas with sudden invasion of the drought, proper irrigation is necessary. Further, sufficient shade is provided during the early stages of growth and the shade trees are cleared after 8-9 years. Leaves are ready for harvesting when the trees are 10 years old and continue to yield for centuries. The leaves are collected every year from young branch and in alternate years from old and weak branches during winters.

Costs involved: Estimated projections have been broadly worked out as below:

No.	Activities	Units	Quantity	Norms	Cost
1.	Constitution of CIG from VFDS	1			
2.	Cost of Planting Material for 5 ha	1	5,500	20	1,10,000
3.	Agricultural Implements	LS		LS	7,000
4.	Digging of pits (60x60x60) cm size	%	5,500	3490.9	1,92,005
5.	Filling of pits (60x60x60) cm size	%	5,500	708.8	38,995
6.	Raising of plants in P-bags in nursery	%	5,500	1,365	75,075
7.	Potassium acrylate	LS		LS	15,000
8.	Manure cost/NPK	LS		LS	20,000
9.	Carriage of manure	LS		LS	2,000
10.	Initial Watering Cost for Planting	LS		LS	50,000
	Total				5,10,075

The maintenance and recurring costs will be reflected in the Business plan.

Financial Returns: Total expected average yield/annum (**from 10th year onward**) will be 10-12 q/tree (approx.). However, to keep the expectations on lower side, let us assume the yield/tree as 50 kg (fresh wt.) and 20 kg (dry wt.) respectively. On the minimum market price of Rs. 2400/quintal, the expected annual return will be to the tune of Rs. 26,40,000/- (for 5 ha).

Cost Benefit Analysis: The Benefit : Cost = 26,40,000/5,10,075 = 5.18. Any project which on PNV gives a value of 5.18 times that of investment is sustainable.

Sustainability: The sustainability of this activity will depend on motivation of people after the project period. If the practice of cultivation coupled with proper care of the above medicinal plant species is adopted on their cultivable land and/or village common lands, they are bound to get rich dividends out of it.