HI TECH NURSERY

Introduction

After the advent of green revolution, more emphasis is laid on the quality of the agricultural product along with the quantity of production to meet the ever-growing food and nutritional requirements. Both these demands can be met when the environment for the plant growth is suitably controlled and this can be done by precision farming. Hi tech Agriculture is one method of precision farming, generally defined as information and technology based nursery management system to identify, analyse and manage variability within fields for optimum profitability and sustainability. It is the most practical technique of achieving the objectives of protected agriculture, where natural environment is modified by using automated engineering principles to achieve optimum plant growth and yield.

Market Potential

Agriculture is the backbone of our country and has a prime role in Indian economy. India is endowed with a remarkably heterogeneous area characterized by a great diversity of agro climatic zones, allowing for production of a variety of horticultural crops such as fruits, vegetables, flowers, spices, plantation crops, and medicinal and aromatic crops.
The increase in the world's population, accompanied by the shrinking area of arable land used to meet future food demands of the world, is already constraining Earth's limited agricultural and natural resources. As an alternative to traditional open farming methods, plants can be grown in protected environments, such as hi-tech nurseries. They comparatively yield more than the traditional farming techniques and use resources more efficiently than conventional farming. They are now receiving much attention, especially in urban and semi-urban areas.

Agricultural sector provides livelihood to more than 65 percent of the labor force. Under agriculture sector, horticultural crops play very important role to economy. It ranks second in fruits and vegetables production in the world, after China. Globalization has improved the chances of export of quality planting material to other countries. Special techniques and care is required for exporting the nursery material.
The important promotional interventions of Government departments towards high value agriculture sector include:

- Incentives/subsidy support for adopting high value agriculture production technologies especially under National Horticulture Mission and other programmes of National Horticulture Board.
- Export facilitation and promotional interventions of Agricultural & Processed Food Products Export Development Authority (APEDA)/ Marine Products Export Development Authority (MPEDA)
- Programmes like precision farming supported by the State Governments with focus on high value crops.

Role of NABARD in supporting Hi-tech Agriculture:

- Framing of appropriate policies with special reference to credit availability
- Credit facilitation through banks and other financial institutions including subsidiaries of NABARD.
- Professional consultancy services through NABCONS for project development, monitoring, and Mid-term evaluation
- Supporting critical infrastructure under RIDF and development of food parks

Advantages

Advantages of hi-tech farming are as follows-

- Yield increases up to 5 to 8 times – high productivity per unit area.
- Better quality growth and uniformity.
- Big savings in key inputs such as water, fertilizers and pesticides.
- Possible even in problematic areas like undulating terrains, saline, and waterlogged areas.
- Produce is available during off-seasons, one can reap the benefits throughout the year.
- Impact on natural ecosystems will be reduced
- Less runoff of chemicals into rivers and ground waters.

Assumptions

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

- Land: 1.5 acre area of Land is owned. (Larger the area, higher is the profitability; since there is huge market potential for such plants thus marketing is not a problem).
- Area:
  - **a.** Proposed area for nursery raising (i.e., the mother bed) is 50,000 sq. ft.
  - **b.** Other activities area is around 1350 sq. ft.
- Power: Power Consumption is 1500 KWH/year, hence a DG Set of 25 KVA power is included.
- Land Development: The Land development cost includes:
  - **a.** Water Supply Arrangements
  - **b.** Rain water Harvesting System
  - **c.** Water Treatment Plant
  - **d.** Fencing Cost
  - **e.** Mother Bed Development Cost (50,000 sq. ft.): 40 mother beds

(50 ft.* 25 ft. being size of each bed) with an internal walking space.

f. Net House and shading system construction

- Civil Works and Building: It includes:
  - **a.** Production room (for activities like- coco peat mixture preparation, for keeping fertilizers and manure, micronutrients for plants, etc.)
  - **b.** Office Area
  - **c.** Equipment Storage Area
  - **d.** Germination Chamber
  - **e.** Net House
  - **f.** Shading system
- Security: Provision for round the clock Security within the nursery.
- Preliminary and Preoperative period is 6 months.
- 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.
- These plants are grown using bio fertilizer only. No chemical fertilizers used.

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

Name of the Plant	Annual Production (in units) In 50000 sq. ft.
Cucumber plant	3,03,68,000
Cherry Tomato plant	3,03,68,000
Capsicum Plant	3,03,68,000

Manufacturing Process

The technique used for setting up Hi-Tech nursery in the Model DPR is **PRO TRAY TECHNIQUE.** Plastic trays or pro-trays having different sizes of cells are commonly used for raising vegetable seedlings. These trays help in proper germination, provide independent area for each seed to germinate, reduce the mortality rate, maintain uniform and healthy growth of seedlings easy to handle and store, reliable and economical in transportation. The steps are as follows-

- The seedling tray (pro-tray) is filled with the growing medium (coco peat, perlite and vermiculite in the ratio 3:1:1).
- A small depression (0.5 cm) is made in the center of the cell of the pro tray for sowing, one-two seeds per cell is sown and covered with medium.
- Coco peat with 300 to 400 per cent moisture is used and hence no immediate irrigation is required until germination.
- After sowing, 10 trays are kept one over other for 3 to 6 days.
- The entire stack is covered using polyethylene sheet to ensure conservation of moisture until germination. The stacked trays are spread once the germination commences.

- The trays are shifted to net house on germination of seedlings and spread over the beds.
- The trays are irrigated lightly every day depending upon the prevailing weather conditions by sprinkler irrigation system.
- Drenching the trays with fungicides as a precautionary measure against seedling mortality is also being done.
- Spraying of water soluble fertilizer twice (12 and 20 days after sowing) is practiced to enhance the growth of the seedlings.
- The trays are provided with protective cover from rain by covering with polyethylene sheets in the form of low tunnel whenever it rains.
- The seedlings at right stage of planting are hardened by withholding irrigation and reducing the shade before transplanting or selling to the growers.

Cost of Project

Particulars	Amount (Rs. in lakhs)
Owned Land	-
Civil Works and Building	114.90
Land Development Cost	21.75
Mother Bed Preparation	5.00
Plant & Machinery (Annexure)	35.60
Miscellaneous Fixed Assets (Annexure)	1.97
DG Set	3.00
Escalation & Contingencies (2% on construction costs)	3.64
Preliminary & Preoperative Expenses	13.26
Sub-total (A)	**199.12**
Working Capital Margin @25% of Total WC Requirement	1.25
Total Project Cost	**200.37**
Total Working Capital Requirement (Lump sum) **(B)**	5.00
MEANS OF FINANCE	
Total Funds Required (A+B)	**204.12**
Loan Component-	
TERM LOAN (60% of A)	119.47
WORKING CAPITAL (75% of B)	3.75
Total	**123.22**
Equity	80.90
Total	**204.12**

Detailed Cost Element

Sl. no.	Particulars	Quantity	Rate	Amount (Rs. in Lakhs)
1	Pro Tray	32000	50	16.00
2	Automatic Nursery Tray Seeding Machine	1	450000	4.50
3	Coco peat lifting machine	1	350000	3.50
4	Weed Mat	8000	20	1.60
5	Mist formation Device	20	10000	2.00
6	Humidity Control System	20	40000	8.00
Total				**35.60**

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	10.14
Interest Cost for period before commercial operations	2.52
Total	**13.26**

Salary

Designation	Manpower	Amount (Rs. in Lakhs)
Agricultural Technician	1	2.40
Office staff cum Storekeeper	2	3.36
Skilled Workers	5	5.40
Workers (Contract Basis)	7	4.48
Security Guard	2	2.40

Profitability Statement

Amount (Rs. in lakhs)					
Particulars	**Year- 1**	**Year- 2**	**Year- 3**	**Year- 4**	**Year- 5**
A. INCOME					
Annual Sales	1707.64	1828.68	1920.11	2016.12	2116.92
Annual Income	**1707.64**	**1828.68**	**1920.11**	**2016.12**	**2116.92**
B. OPERATING EXPENSE					
Raw Material	1564.72	1675.82	1759.61	1847.59	1939.97
Salary	18.04	18.40	18.77	19.14	19.53
Repair & Maintenance	17.08	18.29	19.20	20.16	21.17
Power	1.61	1.65	1.68	1.71	1.75
Depreciation	10.78	10.78	10.78	10.44	10.44
Total Operating Expenses	**1612.24**	**1724.93**	**1810.04**	**1899.05**	**1992.85**
OPERATING PROFIT (A-B)	**95.41**	**103.74**	**110.07**	**117.07**	**124.07**
C. FINANCIAL EXPENSES					
Interest on Term Loan	9.79	8.34	6.89	5.44	3.99
Interest on WC Loan	0.32	0.32	0.32	0.32	0.32
D. Other Expenses					
Administration and general expenses	17.08	18.29	19.20	20.16	21.17
Total Expenses	**27.19**	**26.95**	**26.41**	**25.92**	**25.48**
Profit before Tax	**68.22**	**76.80**	**83.66**	**91.15**	**98.59**
Provision For Tax @ 25%	17.06	19.20	20.91	22.79	24.65
Profit After Tax	**51.17**	**57.60**	**62.74**	**68.36**	**73.94**
Dividend Declared	0.00	0.00	0.00	0.00	0.00
Retained Profit	**51.17**	**57.60**	**62.74**	**68.36**	**73.94**

Breakeven Point

Break Even Point (BEP)						Amount (Rs. In Lakhs)
SL	**Particulars**	**Year - 1**	**Year - 2**	**Year - 3**	**Year - 4**	**Year - 5**
A.	**Net Sales**	**1707.64**	**1828.68**	**1920.11**	**2016.12**	**2116.92**
B.	**Variable Cost**					
	Raw Material	1564.72	1675.82	1759.61	1847.59	1939.97
	Power and Utility	1.61	1.65	1.68	1.71	1.75
	Total Variable Cost	**1566.34**	**1677.46**	**1761.29**	**1849.30**	**1941.72**
C.	**Contribution (A-B)**	**141.31**	**151.21**	**158.82**	**166.81**	**175.21**
D.	**Fixed and Semi-Fixed Cost**					
	Salary	18.04	18.40	18.77	19.14	19.53
	Repair & Maintenance	17.08	18.29	19.20	20.16	21.17
	Interest on term Loan	9.79	8.34	6.89	5.44	3.99
	Interest on WC Loan	0.32	0.32	0.32	0.32	0.32
	Depreciation & Amortization	10.78	10.78	10.78	10.44	10.44
	Total Fixed Cost	**56.01**	**56.13**	**55.96**	**55.51**	**55.45**
E.	**Breakeven Point**	**40%**	**37%**	**35%**	**33%**	**32%**
F.	**Cash BEP**	**32%**	**30%**	**28%**	**27%**	**26%**

Debt-Service Coverage Ratio

					Amount (Rs. In lakhs)	
SL	**Particulars**	**Year - 1**	**Year - 2**	**Year - 3**	**Year - 4**	**Year - 5**
i	Profit	51.17	57.60	62.74	68.36	73.94
ii	Depreciation	10.78	10.78	10.78	10.44	10.44
iii	Interest	9.79	8.34	6.89	5.44	3.99
A	**Total (i + ii + iii)**	**71.74**	**76.72**	**80.42**	**84.24**	**88.38**
i	Interest	9.79	8.34	6.89	5.44	3.99
ii	Principal repayment	17.07	17.07	17.07	17.07	17.07
B	**Total (i + ii)**	**26.86**	**25.41**	**23.96**	**22.51**	**21.06**
	DSCR (A / B)	**2.67**	**3.02**	**3.36**	**3.74**	**4.20**

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% p.a. with the moratorium period of 6 months.

Address of Vendors

Name of the Vendor	Address and Contact Number
Poojitha Packaging Industries	House No. 6-1-74, Near Hanuman Temple, Balanagar, Hyderabad-500042, Telangana, India Contact No.- 9849136431
Team Seeds Pvt. Ltd.	Dabawali Road, Sirsa (Haryana) Pin Code- 125055 Contact No.- 90176-30088
Europack Machines (India) Private Limited	Saki Naka, Mumbai, Maharashtra Contact No.- 8048079281

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	119.47	119.47	119.47	119.47	119.47	119.47	110.94	110.94	110.94	110.94	110.94	110.94	
Repaid						8.53						8.53	17.07
Closing	119.47	119.47	119.47	119.47	119.47	110.94	110.94	110.94	110.94	110.94	110.94	102.41	
Interest			2.54			2.54			2.36			2.36	9.79
II													
Principal													
Opening	102.41	102.41	102.41	102.41	102.41	102.41	93.87	93.87	93.87	93.87	93.87	93.87	
Repaid						8.53						8.53	17.07
Closing	102.41	102.41	102.41	102.41	102.41	93.87	93.87	93.87	93.87	93.87	93.87	85.34	
Interest			2.18			2.18			1.99			1.99	8.34
III													
Principal													
Opening	85.34	85.34	85.34	85.34	85.34	85.34	76.81	76.81	76.81	76.81	76.81	76.81	
Repaid						8.53						8.53	17.07
Closing	85.34	85.34	85.34	85.34	85.34	76.81	76.81	76.81	76.81	76.81	76.81	68.27	
Interest			1.81			1.81			1.63			1.63	6.89
IV													
Principal													
Opening	68.27	68.27	68.27	68.27	68.27	68.27	59.74	59.74	59.74	59.74	59.74	59.74	
Repaid						8.53						8.53	17.07
Closing	68.27	68.27	68.27	68.27	68.27	59.74	59.74	59.74	59.74	59.74	59.74	51.20	
Interest			1.45			1.45			1.27			1.27	5.44
V													
Principal													
Opening	51.20	51.20	51.20	51.20	51.20	51.20	42.67	42.67	42.67	42.67	42.67	42.67	
Repaid						8.53						8.53	17.07
Closing	51.20	51.20	51.20	51.20	51.20	42.67	42.67	42.67	42.67	42.67	42.67	34.14	
Interest			1.09			1.09			0.91			0.91	3.99
VI													
Principal													
Opening	34.14	34.14	34.14	34.14	34.14	34.14	25.60	25.60	25.60	25.60	25.60	25.60	
Repaid						8.53						8.53	17.07
Closing	34.14	34.14	34.14	34.14	34.14	25.60	25.60	25.60	25.60	25.60	25.60	17.07	
Interest			0.73			0.73			0.54			0.54	2.54
VII													
Principal													
Opening	17.07	17.07	17.07	17.07	17.07	17.07	8.53	8.53	8.53	8.53	8.53	8.53	
Repaid						8.53						8.53	17.07
Closing	17.07	17.07	17.07	17.07	17.07	8.53	8.53	8.53	8.53	8.53	8.53	-0.00	
Interest			0.36			0.36			0.18			0.18	1.09