MBM-CARI-VII

Protected cultivation of High value vegetables

Rationale

Andaman and Nicobar Islands receive more than 3000mm of rainfall in a year from May-Nov and the weather conditions are very hostile during this period. Due to heavy rain the vegetable production is very limited in these months and there is always scarcity of vegetables in the market and if available, it is beyond the reach of common man because of high prices. The land is a constraint and the demand of vegetables and flowers are increasing with increased in local population as well as tourists.

Polyhouse cultivation is an alternate as it ensures high productivity per unit area with the genetic potentiality of the crop being fully exploited, off season vegetables can be grown which fetch high prices in the market, off season healthy nursery can be raised, good quality produce free from any blemishes and finally it is easy to protect the crops against pests and diseases and extreme climatic conditions.

Structure of low cost polyhouse

Polyhouses are framed structures covered with transparent or a translucent material and large enough to grow crops under partial or fully controlled environmental conditions to get maximum productivity and quality produce. Polyethylene/plastic film covered greenhouses are being widely used in recent years.

Low cost polyhouse has two distinct segments i.e. frame and glazing material. The frame made up of bamboo is important component of polyhouse as it provides support to glazing material. In this greenhouse north and south roof has been covered with FRP plain sheet or double layered UV stabilized 250 micron transparent polyethylene sheets and there is no provision of cooling arrangement like forced convection, evaporative cooling and misting. The roof provided in the greenhouse is protected from soil erosion. Heat and mass transfer will be through natural convection only. All four sides of greenhouse were covered with plastic coated GI wire / insect proof nets of 40 mesh to avoid the damage from giant snails, birds, dogs and animals. Cost of materials for low cost has been given in Table 1.

- Structures should be east - west oriented and sufficiently strong to withstand the wind pressure. Sufficient ventilation should be given for exchange of air/heat.
- Film must be stretched and secured to the frame tightly to avoid tearing the film.
- All ventilations must be provided with insect proof mesh

Materials required for effective area (15m x 4.5m) for polyhouse for cultivation

	Length	Quantity	Cost (Rs.)
Bamboo			
Central pole (9 cm dia)	8.0 ft	15 nos	300.00
Side pegs (16 cm dia)	3.0 ft	26 nos	350.00
Split bamboo strip	20 ft	30 nos	550.00
Cladding materials			
UV stabilized sheet (200 micron, 7m width)	18 m	25 kg	2,800.00
Other materials			
Tarkol 5 kg, GI, wire 3 kg, nut bolts, ordinary plastic film (5 kg)			250.00
Labour	6 man days		600.00
	Total		4,850.00

Cost / m^2 = Rs. 71.8 say Rs. 72 / m^2

Irrigation

Providing irrigation through drip system is desirable as it reduces the humidity build up inside polyhouse after irrigation. Application of fertilizers through irrigation helps in saving the quantity of fertilizers and labour.

Crops suitable for hi-tech cultivation

Due to the exorbitant market prices prevailing in the market some of the vegetables are found to be highly profitable provided they are taken in control conditions with utmost precautions in management. The following crops can be taken for cultivation under the polyhouse conditions namely, Capsicum, Tomato, French beans, Cauliflower, Chillies, Broccoli, Knol Khol, and Coriander.

Pests and diseases

Normally the incidence of pests and diseases in polyhouse is less as compared to outside conditions. However, due to high crop density and congenial microclimate inside the structure, spread of pests and disease is faster once there is an entry of pest by improper management of polyhouse. In humid tropical climate, proper ventilation with insect proof mesh is recommended.

Suitable crops varieties for hi-tech cultivation under low cost poly house

Crops	Varieties	Season
I- Year		
Tomato	Naveen,Kanaka	May- Aug
French bean	Kentucky Wonder, Contender	Sep- Nov
Cauliflower	White Marble,Indam	Dec- Feb
Coriander	CO-1, Mehak	Mar- April
Green Manure	Dhanicha	May
II- Year		
Tomato	Naveen, Kanaka	June-Sept
French bean	Kentucky Wonder, Contender	Oct- Dec
Chilies	KA-2, Arka Lohit	Jan- April
Cowpea	Arka Suman	May- June
Other Crops		
Okra/Bhendi	Arka Anamika	May- June
Palak	All Green, Pusa Joyti	June- July

Cost Benefit Ratio Analysis of Tomato Under Polyhouse

S.No.	Particulars	Quantity	Rate (Rs)	Amount (Rs.)
I	Nursery			
1.	Seed	15 g	600g	9.00
2.	Nursery management	1 manday	100/ manday	100.00
II	Main field			
1.	Land preparation	3 manday	100/ manday	300.00
2.	FYM & Fertilizer			
i.	Urea	5.2 Kg	7.55/ Kg	39.26
ii	Single Super Phosphate	6.64 Kg	7.85/ Kg	52.12
iii	Murate of Potase	1.96 Kg	7.60/ Kg	14.86
iv	Compost preparation			300.00
3.	Transplanting	1 manday	100/ manday	100.00
4.	Labour Charges			
i	Fertilizer application	1 manday	100/ manday	100.00
ii	Intercultural operations (weeding, earthing up, staking, irrigation etc.	30 manday	100/ manday	3000.00
5.	Plant production chemicals			400.00
6.	Harvesting (12 harvests)	1 manday/ harvest	100 manday	1200.00
7.	Miscellaneous expenses			400.00
	Total cost of cultivation			6015.00
	Average yield kg/500 sq m	1200 kg	15/kg	18000.00

Net Return- 18000-6015 = Rs. 11,985.00 for four month

Net return /rupees of investment = 15000 / 6015 = 2.50

Cost Benefit Ratio Analysis of Capsicum Under Polyhouse

S. No.	Particulars	Quantity	Rate (Rs)	Amount (Rs.)
I	Nursery			
1.	Seed	15 g	3000 g	45.00
2.	Nursery management	1 manday	100/ manday	100.00
II	Main field			
1.	Land preparation	3 manday	100/ manday	300.00
2.	FYM & Fertilizer			
i.	Urea	16.27 Kg	7.55/ Kg	123.00
ii	Single Super Phosphate	31.25 Kg	7.85/ Kg	245.00
iii	Murate of Potash	4.98 Kg	7.60/ Kg	37.84
iv	Compost preparation			300.00
3.	Transplanting	1 manday	100/ manday	100.00
4.	Labour Charges			
i	Fertilizer application	1 manday	100/ manday	100.00
ii	Intercultural operations (weeding, earthing up, staking, irrigation etc.	30 manday	100/ manday	3000.00
5.	Plant production chemicals			400.00
6.	Harvesting (12 harvests)	1 manday/ harvest	100 manday	1200.00
7.	Miscellaneous expenses			400.00
	Total cost of cultivation			6350.00
	Average yield kg/500 sq m	2000 kg	35/kg	70,000.00

Net Return- 70,000-6350 = Rs. 63,650 for five month

Net Return /rupees of investment = 70,000 / 6350 = 11.20