PROJECT REPORT ON

Hydroponic Vegetable & Fruits Production Under Greenhouse

SUBMITTED BY:

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Project Location:
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C O N T E N T S

CHAPTER - I

ABOUT THE FIRM & PROMOTER

PARTICULARS	**ABOUT THE PROMOTER**
1. Name	: xxxxxxxxxxxxxx
2. Address	: xxxxxxxxxxxxxx
3. Contact Number	: xxxxxxxxxxxxxxx
4. Date Of Birth	: xxxxxxxxxxxxxx
5. Educational Qualification	: xxxxxxxxx
6. Project Location	:xxxxxxxxxxxxxxx
7. Constitution	: xxxxxxxxxxxxxx
8. Experience	: xxxxxxxxxxxxxx

CHAPTER – II

PRODUCTION TECHNOLOGY

Hydroponics is a technology for growing plants in nutrient solutions (water containing fertilizers) with or without the use of an artificial medium (sand, gravel, vermiculite, rockwool, perlite, peatmoss. coir, or sawdust) to provide mechanical support.

Hydroponic growing (as opposed to soil growing) allows us to control the nutrient levels for your plants directly. Because of the higher control over nutrients, hydroponically grown plants generally have a much higher yield than similar plants grown in soil.

Hydroponics Growing

A plant gets its food source by turning Co2 , light and water (or hydrogen) into carbohydrates through a process called photosynthesis. With hydroponics growing, plants are grown without soil so they must get their nutrients from the nutrient solutions added to water. The absence of soil in growing means that hydroponics systems must have some way of supporting the plants while still allowing the bare root system maximum exposure to the nutrient solution. Often a "growing medium" is used for support and to aid in moisture and nutrient retention in hydroponics growing. Because they lack media to store water and nutrients, water culture systems need a continuous flow of nutrients to prevent drying out the plant roots. 2 Plants need an energy source in order to grow. With hydroponics growing this energy may come from natural light, which has the full spectrum of color or through the use of different types of artificial lighting (grow lights), which can be selected for specific plant varieties and optimum plant growth characteristics.

What do we need to start hydroponic production?

Commercial production unit -

- Water is the most important consideration, that is in terms of quality, quantity and reliability.
- Market. Know what, where and when to market your crop.
- Hydroponics is labour intensive. During peak season, labour must be available for 7 days a week.
- Management skills: Production, labour, marketing and infra-structure.

- Expertise in crop production, fertilisation and irrigation, pests and disease management. Location: Infra-structure, labour, market etc.
- Financing: The amount needed depends on the size, type of greenhouse, labour cost and your market.
- Dedication: labour and management in general.

Basics of hydroponics

To be able to produce vegetables successfully year after year, one needs to be familiar with the basics of hydroponics in term of the plant, growing medium, water and nutrients.

Proposed vegetables & fruits to be grown in hydroponics-

Basically all high value crops can be grown. Proposed vegetables & fruits are Tomatoes, cabbage, lettuce, strawberries, spring onions, carrots, cucumbers, spinach & blueberries.

Seeds are available from seed companies.

Taking care of plants:

Different crops are planted at different spacing. Small-growing plants can be planted close to each other. Large-growing plants need more space to grow and must be spaced further apart.

• Water fl ow must be checked every day and adjusted when necessary.

• If plants turn yellow, it is normally a symptom of nutrient defi ciency, too little light or a disease.

• Inspect the leaves every day for disease symptoms and insects. Act immediately if a problem occurs.

• Tall plants need to be trained and pruned to make optimal use of the expensive greenhouse space.

Advantages of hydroponics

• No soil is needed

• The water stays in the system and can be reused- thus, lower water costs

• It is possible to control the nutrition levels in their entirety- thus, lower nutrition costs

• No nutrition pollution is released into the environment because of the controlled system

• Stable and high yields

• Pests and diseases are easier to get rid of than in soil because of the container's mobility

Disadvantages of hydroponics

• The hydroponic conditions (presence of fertilizer and high humidity) create an environment that stimulates salmonella growth.

• Another disadvantage is pathogens attacks including damp-off due to Verticillium wilt caused by the high moisture levels associated with hydroponics and overwatering of soil based plants.

• Also, many hydroponic plants require different fertilizers and containment system.

Harvesting

In general vegetable crops are perishable and their shelf life and quality depend on number of actions. Such actions include:

• Pick at the right stage without damage to the plant.

• Pick early in the morning or when it is cool.

• Keep picked vegetables out of the sun.

• Handle carefully.

• Store them at the right temperature (depends on crop).

• Use the right packaging (depends on crop and market).

• Transport with care.

Pests and diseases

The optimal growing conditions for plant growth also provide favourable conditions for the development and spread of diseases and pests. Hydroponic producers are thus faced with the challenge of maintaining conditions optimal for plant growth but not for disease or pest development. This balance is often very difficult to maintain, and systems must be managed carefully. It is important for a producer to know what pests or diseases are likely to become a problem. Steps can then be taken to reduce the possibility of the pest or disease entering the greenhouse and gaining a foothold on the plants.

Tips to prevent spread of diseases

• The most important tools are knowledge and dedication

• Several cultivation practices can prevent the spread of disease (e.g. crop rotation)

• Sanitation, i.e. cleanliness inside and outside the greenhouse or planted area as well as all persons entering the planted area.

CHAPTER – III

MARKET POTENTIAL

People are scared to eat even farm fresh produce in the fear of pesticides. Luckily, there is a trustworthy solution to this problem - Hydroponic farming. It is the most appropriate solution to have pesticide free, healthy farm produce which is, in addition, full of nutrients. With the increasing population, water scarcity, and the ecological impact , hydroponics is the best choice for commercial as well as home-based farming. Among many advantages, hydroponics allows us to produce more (20 to 30%) high-quality vegetables and fruits, save on water and nutrient consumption.

There is increased demand for organically grown vegetables & fruits by using hydroponic technology. Marketing of these vegetables & fruits is the crucial factor for the success of the project. Progressive farmers are showing interest in the cultivation of these crops under protected conditions, as this type is having definite qualitative and quantitative advantage over the traditional cultivation.

IV. ECONOMICS OF THE PROJECT

A. PROJECT PROFILE (Financial)

Sr. No.	PARAMETERS	VALUE
1	Unit Size in sq.m.	4,000
2	Product	Tomatoes, Cabbage, Lettuce, Strawberries, Spring onions, Carrots, Cucumbers,
3	Cost of the project	77,90,000
4	Bank loan	62,32,000
5	Margin money	15,58,000
6	Financial Indicators	
	BCR at 15% DF	1.33 :1
	NPW at 15% DF Rs.	61,91,582
	I R R %	52.8
7	Average DSCR	2.5
8	Interest Rate (% per anr	12
9	Repayment	5 years

B. BASIS & PRESUMPTIONS

Sr. No.	Particular	Unit	Quantity
I.	**Techno-economic parameters**		
	Mortality	**%**	5
	Payback period		5 years
II.	**Expenditure norms**		
	Planting material	Rs./sq.m.	50
	Water Soluble Fertilizer per annum	sq ft.	100
	Organic Pesticides per annum	sq ft.	40
	Number of semiskilled workers	Nos.	10
	Cost of one semiskilled worker per annum	Rs.	96,000
II.	**Income norms**		
	Yield of Vegetables per day (area alloted 3500 sq.m.)	Ton	0.8
	Sale price of Vegetables	Rs./Kg	25
	Yield of Black berry per annum (area alloted 500 sq.m.)	Ton	1.0
	Sale price of Blackberry	Rs./Kg	2,500

C. TOTAL COST OF PROJECT

Sr. No.	Particular	Unit	Unit Rate in Rs.	Quantity	Amount in Rs.
I.	**Cost of Polyhouse**	Sq.m.	950	4,000	38,00,000
II.	**Initial Planting cost**				
	Plastic Beds	Rs./sq.m.	200	4,000	8,00,000
	Growth media (Coconut Husk)	Rs./sq.m.	100	4,000	4,00,000
	Irrigation system (with drip)	Rs./sq.m.	150	4,000	6,00,000
	Planting material	Rs./sq.m.	50	4,000	2,00,000
	Water Soluble Fertilizers	Rs./sq.m.	25	4,000	1,00,000
	Organic Pesticides	Rs./sq.m.	10	4,000	40,000
	Manpower & supervision	Rs./sq.m.	50	4,000	2,00,000
III.	**Cost of grading/pack house**	Sq. ft.	650	1,000	6,50,000
IV.	**Vehicle for transportation**	Nos.	5,00,000	1	5,00,000
V.	**Consultancy Fees**	Lumpsum			5,00,000
			TOTAL		**77,90,000**

D. MEANS OF FINANCE

Sr. No.	Particular	Unit	Quantity	Amount in Rs.
1	Term Loan	%	80	62,32,000
2	Own Contribution	%	20	15,58,000
			TOTAL	**77,90,000**

E. PROJECTION OF PERFORMANCE & PROFITABILITY

Sr. No.	Particular	Unit	Unit rate in Rs.	Quantity	I year	II year	III year	IV year	V year
I.	**Income**								
a.	Production Capacity	%			50	70	90	90	90
b.	Production of Vegetables (@ 0.80 Ton per day in 3500 sq.m.)	Ton			146	204	263	263	263
c.	Sale of Vegetables (@ Rs. 25/kg)	Rs.			36,50,000	51,10,000	65,70,000	65,70,000	65,70,000
d.	Production of Blackberry (@ 1 Ton per annum in 500 sq.ft.)	Ton			0.50	0.70	0.90	0.90	0.90
e.	Sale of Blackberry (@ Rs. 2500/kg)	Rs.			12,50,000	17,50,000	22,50,000	22,50,000	22,50,000
				TOTAL (B)	**49,00,000**	**68,60,000**	**88,20,000**	**88,20,000**	**88,20,000**
II.	**Expenditure**								
a.	Cost of Raw Materials								
	Water Soluble Fertilisers	per sq.m.	100	4,000	4,00,000	4,00,000	4,00,000	4,00,000	4,00,000
	Organic Pesticides	per sq.m.	40	4,000	1,60,000	1,60,000	1,60,000	1,60,000	1,60,000
b.	Cost of Consumbles								
	Packaging material	per kg	0.50		73,250	1,02,550	1,31,850	1,31,850	1,31,850
c.	Cost of Utilities								
	Electricity, Water	per sq.m.	50	4,000	2,00,000	2,00,000	2,00,000	2,00,000	2,00,000
d.	Cost of Manpower								
	Semiskilled workers	per annun	96,000	10	9,60,000	9,60,000	9,60,000	9,60,000	9,60,000
e.	Overhead Expenses								
	Transportation	per month	10000	12	1,20,000	14,40,000	14,40,000	14,40,000	14,40,000
	Marketing expenses 1% of sales				49,000	68,600	88,200	88,200	88,200
	Replanting and bed preparation				5,00,000	5,00,000	5,00,000	5,00,000	5,00,000
				TOTAL (A)	**24,62,250**	**38,31,150**	**38,80,050**	**38,80,050**	**38,80,050**
III.	**Net Income**			**TOTAL (A-B)**	**24,37,750**	**30,28,850**	**49,39,950**	**49,39,950**	**49,39,950**

F. Financial Analysis

Particulars		I year	II year	III year	IV year	V year
Capital Costs		77,90,000				
Recurring cost		24,62,250	38,31,150	38,80,050	38,80,050	38,80,050
Total Cost		**1,02,52,250**	**38,31,150**	**38,80,050**	**38,80,050**	**38,80,050**
Benefit		49,00,000	68,60,000	88,20,000	88,20,000	88,20,000
Depreciated value of buildings @ 10%						3,80,575
Depreciated value of Machinery & equipments @ 15%						26,99,550
Total Benefit		**49,00,000**	**68,60,000**	**88,20,000**	**88,20,000**	**1,19,00,125**
Net Benefit		**-53,52,250**	**30,28,850**	**49,39,950**	**49,39,950**	**80,20,075**
Discounting Factor@ 15%		0.87	0.76	0.66	0.57	0.50
NPV cost at 15% DF		89,19,458	29,11,674	25,60,833	22,11,629	19,40,025
NPV benefits at 15% DF		42,63,000	52,13,600	58,21,200	50,27,400	44,10,000
NPW at 15% DF	**61,91,582**					
BCR at 15% DF	**1.33 :1**					
IRR %	**52.76**					

G. Term Loan Repayment

Rate of interst - % per annum **:** 12

Opening balance of term loan **:** 62,32,000

Year	Loan Outstanding	Gross Surplus	Principal	Interest	Total Repayment	Net Surplus	DSCR
1	62,32,000	24,37,750	1246400	747840	1994240	4,43,510	1.2
2	49,85,600	30,28,850	1246400	598272	1844672	11,84,178	1.6
3	37,39,200	49,39,950	1246400	448704	1695104	32,44,846	2.9
4	24,92,800	49,39,950	1246400	299136	1545536	33,94,414	3.2
5	12,46,400	49,39,950	1246400	149568	1395968	35,43,982	3.5
						Avg. DSCR	**2.5**