Cold Room (Staging)- Model DPR

Directorate of Horticulture, Government of Bihar

Disclaimer: This is just a model DPR prepared based on assumptions for reference purpose only. The project cost and financial projections may vary project to project as per technology selection, nature of civil work, price of raw materials etc.

Table of Contents

1. Project at a Glance

1.	Name of the Unit	:	
2.	Constitution	:	
3.	Date of Incorporation	:	
4.	CIN	:	
5.	PAN	:	
6.	GST		
7.	Registered Office	:	
8.	Factory Address	:	
9.	Name of Directors	:	
10.	Type of Unit	:	
11.	Nature of Project	:	Cold Room (Staging) Unit
12.	Installed Capacity at 100% Capacity Utilization	:	30 MT
13.	Cost of the Project	:	INR
14.	Promoter's Contribution	:	
15.	Proposed Term Loan	:	
16.	Requirement of Working Capital	:	
17.	Proposed Employment	:	
18.	Power Load	:	

2. Introduction

Horticulture has emerged as one of the most important agricultural enterprises in Bihar in the last two decades, as it offers a wide range of opportunities for farmers to diversify their cropping pattern to include fruits, vegetables, flowers, spices, plantation crops, medicinal and aromatic plants. The increasing diversification provides opportunities for absorption of labour and earning remunerative returns to the farmers. The horticultural products form an important component of food and nutritional security in Bihar. To meet the growing demand for affordable and high-quality fruits in local, national, and international markets, this sector is experiencing substantial competition. Since horticultural crops are highly perishable and seasonal in nature, they require adequate post-harvest infrastructure. The State Government is promoting horticulture sector in a big way in Bihar to help the farmers.

1. Fruits Area and Production in Bihar

The total area under fruits cultivation in State was found to be 3.24 lakh Ha with an annual production of 42.56 lakh tons in 2019-20. Among fruits mango constituted largest area in the State with 49% of total area under fruit cultivation followed by litchi, banana and guava with 11%, 10% and 9% of total area under fruit cultivation in State. The last five year trend of area and production of fruits shows that the area under fruit cultivation has increased by 6% with a CAGR of 1.17% and production by 1%.

The area and production of key fruits has been mentioned in the table below:

Table 1: Area and Production of Fruits in Bihar-2019-20

Fruits	Area (Ha)	Production (MT)
Amla/Gooseberry	2207.5	16578.34
Banana	34973.45	1368548.76
Guava	29777	434076.59
Limes and Lemons	19365.75	115084.08
Litchi	36263.78	307996.67
Mango	160242.16	1541286.68
Muskmelon	3129.85	16714.14
Papaya	2572.25	47939.07
Pineapple	4245.5	111890.50
Sweet Orange /Mosambi	445	4645.00
Watermelon	2352.5	36143.60
Other Citrus	29014.23	255309.99
Total	**324588.97**	**4256213.42**

Source: Directorate of Horticulture, GoB

The major districts of fruit cultivation in State includes- Muzaffarpur, East Champaran, West Champaran, Patna, Vaishali, Madhubani, Katihar, Samastipur, Rohtas, Sitamarhi, Darbhanga, Purnia, Nalanda and Bhagalpur, together constitute about two-third of area and production of fruits in the State.

2. Vegetables Area and Production in Bihar

Bihar is one of the leading producer of vegetables in the country. The total area under vegetable cultivation in the State was 8.24 lakh Ha with annual production of 163.15 lakh tons during 2019-20. Potato cultivation was found to be highest in State and it constituted about 31% of the total area under vegetables, followed by cauliflower, brinjal, okra and onion with 8%, 7.5%, 7% and 7%, respectively. The last five year trend of vegetable cultivation shows that through the area has declined by 2%, the production increased by 13% with a CAGR of 2.53%.

Table 2: Area and Production of Vegetables in Bihar-2019-20

Vegetables	Area (Ha)	Production (MT)
Beans (All Including Lab-lab (Sem))	17076.4	116215.08
Bitter Gourd	11861.36	95569.37
Bottle Gourd	44027.85	660553.6
Brinjal	61888.17	1320501.57
Cabbage	41241.79	722150.96

Vegetables	Area (Ha)	Production (MT)
Carrot	13580.21	144972.89
Cauliflower	68477.62	1031568.75
Cucumber	5043.52	30776.13
Elephant Foot Yam/Amorphophallus/Jimikand	1650.9	30130.83
Green Chilly	47622.51	489239.32
Kaddu/Pumpkin	1420.72	15974.75
Mushroom	-	1374.8
Okra /Ladies Finger	60447.31	842010.51
Onion	60086.83	1319535.23
Peas (Green)	11549.63	66826.15
Pointed Gourd /Parwal	8859.38	89580.95
Potato	257989.62	7710073.41
Radish	24318.83	232636.03
Sweet Potato	1904	13634.8
Tomato	52210.94	964221.93
Other Vegetables	32770.23	417470.86
Total	**824027.82**	**16315017.92**

Source: Directorate of Horticulture, GoB

The major districts of vegetable cultivation in State includes- Patna, Vaishali, Madhubani, Muzaffarpur, East Champaran, West Champaran, Saran, Gopalganj, Katihar, Samastipur, Rohtas, Darbhanga, Nalanda, Begusarai and Bhagalpur, together constitute more than two-third of area and production of fruits in the State.

3. Need Gap Analysis

Though State is one of the largest producer of various F&Vs however due to lack of various post-harvest management infrastructures, there is considerable volume loss. This is not only commodity loss but also has considerable impact on farmer/producers of F&Vs who has to make immediate sale of the produce due to the low shelf life and lack of any storage infrastructures. The key reasons driving the huge volume of wastages are poor post-harvest system, inefficient supply chains, lack of proper storage and processing infrastructure.

The typical value chain from farm to end consumer involves the practices of Aggregation to concentrate the produce at one location, maintenance of temperature by bringing in the process of pre-cooling, preservation of shelf life through apt storing practices followed by distribution and reaching the consumer. This requires availability cold storages in different forms and capacity.

The Key benefits of a proper cold store infrastructure

- **Ensured Quality**: The cold storage would help in maintaining respiration rate of commodities, reducing transpiration, lowering microbial activity etc. and thus reduces the rate of deterioration and ensures quality of the produce.
- **Enhanced Shelf life**: The structure helps in storing the produce and make it available at the optimum time by increasing the shelf life for days, weeks or even months
- **Maintains the commodity market price**: The storage helps in normalising the price of crops throughout the year through the making available quality produce during lean period ensuring uninterrupted supply and thereby minimizing food inflation.
- **Enhanced market linkage**: It empowers farmers with the ability to capture a larger buyer base and helps to bring their harvest to more valuable.

3. Background

A. Brief Details

The component is an insulated and refrigerated chamber which is a necessary combination for pre-cooling units and serves as a transient storage, while allowing the pre-cooler to be utilized for next batch load of incoming produce.

A. Component Description

The component of cold room staging includes-

i. Insulated room of 100 m^3 with capacity to Store 30 MT
ii. Associated Refrigerated equipment
iii. Staging Area- Adjoining area to load vehicles for dispatch

The cold room staging must have the following:

i. Integrated pack houses
ii. A Pre-cooler Unit
iii. An Ante room for staging

B. Operational

Staging cold room is a small temperature controlled room appended to a pre-cooler s as to allow temporary holding prior to staging for onward dispatch (on to a reefer van). A pre-cooling unit along with such a cold room is necessary to enable temperature controlled post-harvest handling of F&Vs or any perishable commodities.

In view of the fact that existing cold stores at farm gate may need to select only individual component items to fulfill the operational need to serve such as- pack houses, pre-cooler or staging cold room, needs to be kept as individual component to suit the existing requirements. For any new installations, all three components needs to be installed.

Temperatures maintained in cold chain storage facilities may be divided into two categories:

- Refrigerated Temperature: Refrigerated temperatures are typically those above 0- degree C (32oF).
- Frozen Temperature: Frozen temperatures those lower than 0-degree C.

C. Benefits

1. Easy to use for wide range of commodities under F&V by adjusting the temperature and other requirements
2. Customizable size and settings and hence easy to handle
3. Useful for enhancing the shelf life of produce harvested at the farm gate
4. The available space allows for storage during off season.
5. Reduces the cost of storage through wastage minimization and increased efficiency during storage

D. Bihar Potential for production of F&Vs

1. Fruits

1. **Mango**: Mango constitutes the largest area under fruit cultivation in Bihar. The key varieties such as- Jardalu Aam, Maldah Aam are some of the famous varieties cultivated in the State. Jardalu Mango has been GI tagged. The total area and production under mango during 2019-20 was- 1.6 lakh Ha and 15.41 lakh tons, respectively. Bhagalpur, Darbhanga, Muzaffarpur, West and East Champaran, Samastipur, Madhubani, Patna, Sitamarhi and Vaishali are top ten producers of mango in the State among other districts.

2. **Litchi**: Bihar is the leading producer of Litchi in the country contributing almost half the total national production during 2018-19, i.e.,- 45%. Litchi cultivation covered an area of about 0.36 lakh ha in 2019-20 and production volume of 3.07 lakh tons. It contributes to 11.2 % of fruit crop acreage and 7.2% of fruit production in Bihar. Muzaffarpur is the largest Litchi producing district followed by Vaishali, Sitamarhi, East Champaran and Madhubani.

3. **Banana**: Banana is the third largest growing fruits in State in terms of area and cultivated in an area of 0.34 lakh Ha with a production of 13.68 lakh tons. It constitutes an area of 10.8% under fruits and 32.2% of total

fruit production. Katihar, Muzaffarpur, Samastipur, Vaishali and Darbhanga are top five producing regions of Banana in addition to other districts.

4. **Guava:** Guava is cultivated in area of 0.29 lakh Ha with a total production of 4.34 lakh tons constituting about 9.2% and 10.2% to the total area and production of fruits in Bihar. Nalanda, Muzaffarpur, Patna, Rohtas and Vaishali are top five producing districts of guava in the State.

5. **Limes and lemons:** The total area under limes and lemons cultivation in the State was found to be 6% and 2.7% of the total area and production of fruits in the State. Major producing districts include- East and West Champaran, Patna, Samastipur and Bhagalpur.

6. **Pineapple**: Pineapple cultivation is confined only to three major districts of- Katihar, Purnia and Kishanganj. Pineapple cultivation occupy an area of 1.3% with production of 2.6% of the total area and production of fruits in the State.

7. **Papaya:** The cultivation of papaya has gained momentum in the State with key initiatives of Directorate of Horticulture in providing quality panting materials and improving the agronomic practices. The total area under Papaya cultivation in the State was found to be 0.8% and total production was 1.1% of the total area and production of fruits in the State. Papaya was found to be cultivated uniformly across all districts with Darbhanga, Muzaffarpur, Nalanda, East Champaran, and Vaishali being the largest producers.

2. Vegetables

1. **Potato:** Bihar is one of the leading producer of potato in the country and the crop constitutes largest area and production among all other vegetables in the State. Potato was cultivated in an area of 2.58 lakh Ha and production of 77.10 lakh tons which is 31.3% and 47.3% of the total area and production of vegetables in the State. Almost half of vegetable production is constituted by potato crop. Patna, Nalanda, Begusarai, Bhagalpur, Darbhanga, Katihar, Mahbubani, Muzaffarpur, East and West Champaran, Nalanda, Purnia, Rohtas, Samastipur, Sitamarhi and Vaishali are top 15 producing districts of potato in the State.

2. **Cauliflower**: Cauliflower is cultivated in large parts of the State and of constitutes about 8.3% of the total area under vegetable production and second highest after potato. The total area under cauliflower was found to be 0.68 lakh Ha and production was 10.32 lakh tons during 2019-20. Vaishali, Nalanda, Katihar, Samastipur and West Champaran are top five producing districts of cauliflower in the State.

3. **Brinjal:** The total area and production under brinjal cultivation was found to be 0.62 lakh Ha and 13.21 lakh tons which is 7.5% and 8.1% respectively, of total area and production of vegetables in the State. Though brinjal is cultivated across the State among all districts- Vaishali, Patna, Muzaffarpur, Begusarai and Darbhanga are major cultivating regions of brinjal in State.

4. **Okra/ Ladies Finger:** Okra is cultivated Patna, Muzaffarpur, Vaishali, Begusarai, Bhagalpur are major growing regions, with cultivation spread across the State. Total area under okra in State was 0.60 lakh Ha with production of 8.42 lakh tons.

5. **Onion:** The total area under Onion cultivation was found to be 0.6 lakh Ha with a production of 13.20 lakh tons during 2019-20 in the State. It constitutes about 7.3% and 8.1% of the total area and production of vegetables in the State. Nalanda, Vaishali, Patna, East and West Champaran and Katihar are major onion producing regions in State.

6. **Tomato:** Tomato is cultivated in an area of 0.52 lakh Ha with a total production of 9.64 lakh tons, which constitutes about 6.3% and 5.9% of the total area and production of vegetables in State. Patna, Vaishali, Begusarai, Nalanda and Muzaffarpur are major production regions of tomato in the State.

7. **Green Chilly:** The total area under green chilly 0.48 lakh Ha and production of 4.89 lakh tons which constitutes about 5.8% and 3% of total area and production of vegetables in State. Patna, Vaishali, East Champaran, Katihar and Begusarai are some of the major growing regions of green chilly in State.

8. **Bottle Guard:** The total area under bottle guard cultivation in the State was 0.44 lakh Ha with a total production of 6.61 lakh tons which constitutes about 5.3% and 4% of total area and production under vegetable in State. Vaishali, Muzaffarpur, Sitamarhi, West Champaran and Katihar are the major producing districts of bottle guard in State.

9. **Cabbage:** Cabbage was cultivated in a total area of 0.41 lakh Ha and 7.22 lakh tons which constates about 5% and 4.4% of total area and production in State. It is largely cultivated across State with Patna, Nalanda, Vaishali, Samastipur, Katihar and West & east Champaran districts being the largest producers of cabbage in the State.

10. **Beans (Sem):** The beans cover an area of 0.17 lakh Ha and production 1.16 lakh tons which constitutes about 2% and 0.7% of total area and production of vegetables in State. Vaishali, Patna, Nalanda, East & West Champaran, Purnia and Samastipur are major districts for beans cultivation in State.

There exists a huge scope for the development of cold room type small scale structure across these commodities in the production cluster for enhancing the value of the crops and thus. Income of the farmers.

4. Project Background

The Unit propose to install a modern cold room (staging) chamber unit having an installed capacity of 30 MT in …….. Total raw material requirement of the proposed unit, during the peak season of its production, will be about 80MTs (estimated figure). The processing will be done for about 8 months in a year.

The capacity of the unit has been arrived at after giving due consideration to the market demand, the capacity of the promoters to procure raw material, and forward linkages of the promoters.

Current status of the unit:

a. **Items to be manufactured: Cold Room (Staging)**

b. **Capacity of the plant**: 30 MT

c. **Source of power generation/electricity**: Electricity form BSPHCL/SBPDCL, DG Set

d. **Source of water supply:** Own Borewell

e. **Connectivity to road/railways:** NH/SH details along with distance

f. **Mode of transport:** Pickup/Truck/Others

g. **Market:** Details of local market/other market

h. **Employment Generation:**18 nos.

i. **Marketing:**

j. **Waste disposal:** ETP/STP

A Calendar of F&Vs in Bihar (Illustrative)

Flora	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mango		X	X	X								
Litchi			X	X								
Papaya				X	X							
Guava				X	X			X	X	X		
Banana				X	X	X						

5. Organization and Promoter Details

1. Organizational details

The M/s XYZ is a proprietorship/partnership/private company is associated with fruit trading for about 10 years. The unit was incorporated on …… as private limited company under Company's Act. The authorized capital of the company is Rs. ….. lakh and the paid-up capital is Rs. ….. as on ……The details of the unit as per MCA website (only for private/public ltd. companies) are given below:

Company Master Data	
CIN	
Company / LLP Name	
ROC Code	
Registration Number	
Company Category	
Company Sub-Category	
Class of Company	
Authorized Capital(Rs)	
Paid up Capital(Rs)	
Number of Members(Applicable in case of company without Share Capital)	
Date of Incorporation	
Registered Address	
Email Id	
Whether Listed or not	
Date of last AGM	
Date of Balance Sheet	
Company Status(for e-filing)	

Directors/Signatory Details			
DIN/PAN	**Name**	**Begin date**	**End date**

2. Promoters' Background

The unit is a proprietorship/partnership/private limited company/ firm and the proprietor/partners/promoters of the firm has experience in trading of fruits and vegetables and is associated processors. He/They has/have identified fruit juice industry as a profitable business seeing its ever-increasing demand in the local market as well market in the neighboring districts and States. Brief profile of the proprietor/partners/promoters is given below:

a) **Mr. ABC**
b) **Mrs. XYZ**
c) **Mr. DEF**

Net-worth: The details of the net-worth of the unit is given below:

Particulars		Rs. In lakh
Movable assets	A	
	B	
	C	

	Subtotal (A)	
Immovable assets	A	
	B	
	C	
	Subtotal (B)	
	Total	

The total net-worth is more than the proposed grant of the unit.

6. Technology and Process Description

1. Cold Room (Staging)

The cold storage space of the proposed project shall be primarily used for storing fruits and vegetables for short duration storage of around 1-4 weeks. Such cold storage facility would enable them for bargain for a better price of their produce at the bi-weekly /weekly wholesale markets.

The storage life of fruits and vegetables even at low temperatures in general varies between 2 to 4 weeks excepting for a few commodities like apples, oranges, potatoes, cabbage etc. In case of cold room Long term storage is not envisaged and duration of storage is likely to be 1 to 4 weeks.

2. Operation

We propose to install a cold room (staging) infrastructure of around 30 MT which will be utilized by the sorted and graded fruits and vegetables produced in the region.

The ideal environmental condition for storage of fresh fruits and vegetables is the lowest temperature which does not cause chilling injury to the product. Hence, temperature control in cold storage is very important. In mechanical refrigeration, the refrigerated Gas (e.g. Ammonia, Freon etc.) takes out the heat from the chamber/store as it expands. The expanded gas is then compressed and the heat removed from the compressed gas by means of running water or circulation air over the tubes containing the hot gas. The gas is liquefied and the cycle is repeated. With such system accurate temperature control is maintained.

The operation has been planned as leasing model where revenue will be generated by providing the cold storage facility on lease to the third party. We have assumed that the facility will have initial one year for the construction of the facility, followed by growth in the operation utilisation.

Income can be generated from cold rooms in the manner as follows:

- Income of the project shall be by the way of rent paid by hirers of cold storage space on a daily charge basis. It is proposed that space rent shall be Rs.0.30 p per Kg per day.
- Income of the project shall be by way of procurement and trading of vegetables and fruits.
- Income of the project can be made by both the above way i.e. by way of 50% by own trading and 50% by rent basis.

3. Technology

The cold room unit incorporates a refrigeration system to maintain the desired environment for the commodities to be stored. A refrigeration system works on two principles;

1. Vapour Absorption System (VAS).

2. Vapour Compression System (VCS).

Size of the chamber will be of 14'-0"x10"-0"x10-0" for 10 MT capacity cool chambers. The storage racks shall be made of M.S. channels and angles. 60 mm thick PUF panel shall be provided for insulating the cold room walls and ceiling. 80 mm EPS slab, PCC & KOTA stone will be provided for floor insulation. For strengthening the insulation, chicken wire most will be provided with it. R-22/ R 404A refrigerant will be used for the cooling unit. Room temperature of 20C to 60 C will be maintained inside the chamber. The ambient temperature will be 400 C. The total refrigerant capacity will be 30,000 BTU/hr for 10MT capacity cool chamber. Electric load will be 5.9 KW for 10 MT. Power supply will be 230 Volt/3Ph/50 HZ.

[1]Basic Design of 30 MT Cold Room (Staging Capacity)

Sl. No.	Description	Specifications
1.	Room dimension	14ft (L) x 10ft (B)x 10ft(H)
2..	Room temperature	+ 40 C (+ 20 C)
3.	Humidity	85 - 90% RH
4.	Ambience Temperature	430 C

[1] Market Study and NHM Model Project on Cold Room in Odisha

Sl. No.	Description	Specifications
5.	Material to be stored	Fresh vegetables and fruits
6.	Product quantity	10 MT
7.	Product Incoming Rate	33% (3300 kg per day)
8.	Product entry Temperature	28-350 C
9.	Pull down time	24 hrs / Batch
10.	Insulation	60mm PUF with 0.5mm pre painted CRCA Sheet as external finish and internal finish
11.	Floor	60mm thick PUF slab over kota and PCC
12.	Hinge door	34"x 78" – 1No.
13.	Refrigeration unit capacity	30000 Btu/hr @ 4 0C Room temperature & 43 0C Ambient temperatures
14.	No of units	15000 Btu / hr x 2 nos.
15.	Refrigerant	R-22 / R404A
16	Compressor	Reciprocating

[2]Refrigerating Power Estimation (Indicative)

Sl. No.	Particulars	Specifications
1	Capacity	10 MT
2	Cold room temperature	4 °C (± 2 °C)
3	Outside moisture	50 %
4	Type	Pre-fabricated room with floor
5	External Room Dimension	14ft x 10ft x 10ft
6	Insulation	Poly-urethane foam panel (PUF)
7	Insulating outrace	60mm thick
8	Turn over	Long storage
9	Man powers	2 nos.
10	Lighting	178 watt
11	Motor power	225 watt
12	Motor running period	2 – 24 hrs
13	Duration	2 – 24 hrs (Lighting)
14	Product	Fruits & Vegetables
15	Process	Fresh product storage
16	Product entering temperature	28 °C
17	Product leaving temperature	4 °C (± 2 °C)
18	Daily turnover	33 %
19	Processed period	24 hrs
20	Product quantity	10,000 kg
21	Density	181 kg/m³
22	Running compressor	18-24 hrs

[2] Market Study and NHM Model Project on Cold Room in Odisha

[3]Load Power of Cool Chamber

Sl. No.	Particulars	Specifications
1	Ambient losses	28734 watt/24 hrs.
2	Infiltration due to use	11970 watt/24 hrs.
3	Motor load	5396 watts/24 hrs.
4	Product load	42363 watt/24 hrs.
5	Personal load	1013 watt/24 hrs.
6	Lighting load	356 watt/24 hrs.
7	Refrigeration capacity	89832 watt/24 hrs.
8	Refrigeration power for unit	5040 watt

4. Location of the Project

The unit is set up in a land area of 2000 sq. ft. (as illustrative).The land is located along the two lanes all weather main road. The site is around …. Km from …….

The plan and the rough sketch of the existing building and open space is enclosed.

The selection of the location has been done in consideration with the various favorable aspects related with the plant such as:

- Raw material availability
- Connectivity
- Linkages with markets/procurement center
- Availability of infrastructure such as water
- Availability of manpower

5. Management

The cool chamber will be rented out to the farmers, dealers. The company/entrepreneur/FPC, etc. may impose sale of commodities from the unit. The rate of the commodities may be kept little more from market rate. The cool chamber will be initially managed by the personnel on contract for one year and then the staff at FPC or user will be trained to manage the cool chamber. One operator can operate the cold room who can be paid an amount of Rs.5,000/- per month.

[3] Market Study and NHM Model Project on Cold Room in Odisha

7. Procurement Strategy of Raw Materials and Other Inputs

The unit will require approximately 30 Tons of fruit (banana/mango/guava/etc.) per day, The promoters have existing linkages with farmers of nearby areas to procure the required fruit. They have also developed linkages with farmers in other parts of the state which includes bee keeping area of…….. Promoters to begin with will concentrate mainly on the nearby areas to procure commodities for storing for the unit.

1. Backward Linkages:

The promoter has well established backward linkages for its proposed units and it is expected that the raw material can be procured from the local area.

2. Forward Linkages

Fresh F&Vs has a great demand in the metro and urban centers. There exist a growing market of fresh F&Vs in local market and Bihar is a leading exporter of various high quality fruits. The availability of cool chamber unit with state of the art technologies are few in region and State and hence concentrated effort needs to be given to build up the forward linkages.

8. Marketing Plan

The unit, shall sale its produce to the lead fruit marketing market within State or outside State and India i.e., export to EU and USA and middle east. Promoters are also planning to export their produce in near future for that they have export license.

The promoters have existing tie-ups which will be leveraged for selling the produce. The promoters propose to seek the help of the existing marketing intermediaries to develop the market. However, in the future they intend to develop their own marketing team to ensure direct contact with markets for their products.

1. Market Segments

The promoters shall target two market segments for marketing of ripened fruit. These are:

1. Lead dealers/ companies in India
2. Direct exports

2. Product packing

The company will have packaging of varying weights which is suitable for the retail market. It will also use different packing materials for its product.

9. Land Details

1. Land Details

In order to set up a modern biscuit manufacturing unit of the proposed capacity, a land size of approx. 18 to 20 Decimal would be ideal however this may vary with increase in capacity.

The land proposed for the unit Details of the proposed land is given below:

Sale deed dated 18.10.2016 in the name of M/s XYZ with sale value Rs. 0.00/-

Khata no.	Plot no.	Area	Boundary
	Total	**19 decimals**	

The total land area is …… decimal and is in the name of the of the proprietor/firm/company. The proposed land of the unit is an industrial land as per CLU dated …… Character of the land. The cost of the land is Rs. ……. lakh/ the proposed land is a leased land for a period of …… years.

10. Project Cost and Means of Finance

Details of the project cost and means of finance are given below:

1. Project Cost

The Project is estimated to cost Rs. ……lacs. The cost estimates are provided by …… on the basis of quotations received from suppliers and estimates given by chartered engineers. The detailed breakup of the cost of the Project is given below:

Rs in Lacs (Rounded off)

Description	Amount
Land	
Land and Site Development Cost	
Plant Area & Building Development Cost	
Plant and Machinery	
MFA (Including DG set, Transformer, Furniture etc.)	
Preliminary and Pre-operative Expenses	
Contingency	
Margin Money for Working Capital	
Total Project Cost	

Indicative Costs

S.No.	Particulars	Amount (INR lakhs)
1.	Cost of machinery (Per 10 MT Capacity)	**4.14**
2.	Civil cost192sqft	6.00
3.	Electrification, Stabilizer	0.40
4.	Insurance	0.10
5.	Cost of Generator, Accessories, Plastic crates (Per 10 MT Capacity)	2.90
6.	Misc.	0.30
7.	Tax, Installation, etc.	1.16
	Total	**15**

Indicative Assumptions

1. **Option-1**

If the product stored on rented basis, the rent charge is Rs.0.30 kg / day (maximum 300 days storage in a year)
Collected revenue will be = Rs.10000 x 0.30 x 300 = Rs.9,00,000 per year

2. **Option-2**

A- If the products stored on rented basis as well as by own trading.
Products stored on rented basis = 7 MT
Revenue will be collected Rs. 0.30 / kg / day = Rs.7000 x 0.30 x 300 = Rs.6,30,000/-
B- Products will be stored by own trading = 3 MT (8 rotation in a year)
Average profit of mixed vegetables = Rs.5 / kg
Profit for 3 MT vegetable = 3000 x 5 x 8 = Rs.1,20,000/-
Total profit will be A +B = Rs.6,30,000/- + Rs.1,20,000/= Rs.7,50,000/-

Farmer will store the product as per permutation & combination (Rs.0.30/kg/day)

2. Site renovation

Promoters propose renovation of the existing site which shall be used for further expansion of the project (if any). Total investment proposed for site renovation is ……lakhs. (*Factory building either be RCC or PEB structure so the layout plan and cost may vary project to project same will be captured in an applicant's DPR)*

3. Civil construction

Promoters propose to invest Rs…….. lakhs in civil construction as a part of the proposed expansion. Details of the civil construction are annexed to this report.

4. Equipment

The break-up of the estimated cost of major machinery is provided below:

Rs in Lacs

Machinery & Equipment	Type.	Rate/ Unit	Amount
Insulation	60mm PUF with 0.5mm pre painted CRCA Sheet as external finish and internal finish		
Floor	60mm thick PUF slab over kota and PCC		
Hinge door	34"x 78" – 1No.		
Refrigeration unit capacity	30000 Btu/hr. @ 4 0C Room temperature & 43 0C Ambient temperatures		
No of units	15000 Btu / hr. x 2 nos.		
Refrigerant	R-22 / R404A		
Compressor	Reciprocating		
Total			

**The make and specification of P&M may vary project to project based on the quotations from different suppliers.*

Details of the plant and machinery are given below:

Machine	Supplier	Specifications	Remarks
30 MT cold room unit with moisture reduction unit, and packaging, packing strapping	Major cold room unit manufactures in India are the reputed supplier.	The unit will have automatic temperature and humidity control, etc.	The plant is well-equipped to take care of good quality F&Vs. The equipment are based on ….technology The quoted price is exclusive of taxes and other charges

The plant and machines to be procured by the promoters are suitable for the design of the project and balances each of the production stages. The suppliers have prior experience in installing similar type of units. The final prices of the equipment may vary depending on the prevailing tax rate at the time of delivery.

Quotation provided by the promoters have been duly verified by ……. team and found to be satisfactory both in terms of cost and technical specification.

5. Miscellaneous Fixed Assets / Utilities

The breakup of the estimated cost of the miscellaneous fixed assets and utilities is provided below:

Rs in Lacs

Misc. Fixed Assets/ Utilities	Nos.	Rate/ Unit	Amount
Computer			
Pick up van			
Other office equipment			
Total Misc. Equip			

6. Preliminary & Pre-operative Expenses

The provision towards preliminary & pre-operative expenses includes expenditure towards like salaries & administrative expenses, travel expenses, market development expenses, interest during construction period etc. The Miscellaneous charges include the cost incurred towards Administration, Travelling, Market development and other marketing activities.

7. Working Capital Requirement

Rs in Lacs

Sl No	Particular	Stocking Period in Month	Ist Yr	2nd Yr	3rd Yr	4th Yr	5th Yr
1	Raw Materials						
2	Consumable Stores & Packing Material						
3	Finished Goods						
4	Receivables						
5	Expenses for One Month						
	Total Current Assets						
6	**Less: Sundry Creditors**						
7	**Working Capital Gap**						
8	**Total Required Margin**						

8. Contingencies

The amount is calculated at 5% of the cost incurred towards land development, building, plant & machinery and Miscellaneous fixed assets excluding cost of land. It amounts to Rs. 3.00 Lacs in current case.

9. Means of Finance

The cost of the project is proposed to be financed through a mix of equity, grant from Govt. of Bihar and term loans.

Rs in Lacs

Source	Share	Amount
Total		

*- Promoters propose to bring approximately ……lakhs as their equity contribution. Promoters have the required financial strength to bring an equity capital of this amount.

**- Promoters propose to bring in long term debt to the tune of …….. lakh for financing the project. They also propose to bring in Rs……. lakh as margin money towards working capital financing.

Note-1. Under MIDH component, credit linked back-ended subsidy @ 35% of the capital cost of project in general areas with maximum cost of INR 15 lakh/MT of 30 MT capacity

2. The figures are only tentative and may change depending upon the processing infrastructure capacity and promoter's requirement.

10. Operating Cost Assumptions

10.10.1. Packaging material

10.10.2. Power Load Requirement

10.10.3. Employee Cost

The employee cost has been assessed based on an organization structure prepared by the Company which considers the managerial and the support staff required for its proposed level of operations. Total manpower cost per annum is estimated at Rs…….. lakhs as detailed out below:

Sl No	Particulars	No of Employee	Monthly Salary	Total Salary Per Month	Total Salary Per Annum
A	**Technical Staff**				
1	Manager				
2	Storekeeper				
3	Accountant				
4	Operator, fitter, electrician				
5	Helper/ Skilled worker				
B	Unskilled Staff				
6	Peon/Security Guard				
	Total				
	PF, ESI & Other benefits etc @20%				
	Total Direct Wages				
	Total Direct Wages (Rs. In lacs)				

The manpower planning has been done after analyzing similar units. Proposed manpower will be sufficient to carry out the operation.

10.10.4. Cost of insurance and Maintenance

The cost of insurance has been assumed as 1% of cost of Building, Plant & Machinery & Miscellaneous Fixed Assets. Cost of maintenance has been assumed at 3.5% of the value of fixed assets. The costs are at par with industry standard.

10.10.5. Admin & Selling Overheads Costs

Admin overhead Cost has been assumed @ 2.5% of revenues.

11. Financial Assumptions

11.1. Depreciation Rates

Depreciation has been provided on straight-line method, as per the Companies Act, 1956, for book purposes, whereas for tax purposes, written down value method is employed. The rate of depreciation for plant & machinery and miscellaneous fixed assets is taken as 10% for book purposes and 15% for tax purposes.

11.2. Interest

Interest would be charged to the Project at 9% p.a. for Term Loan and working capital loan. A repayment period of 6 years including a moratorium of 6 months has been considered for financial projections.

12. Revenue Assumptions

It is assumed that at 80% capacity utilization the unit would generate revenue of Rs…… lakhs. The assumption is based on

1- Net realization would be 95% of the procured fruits

2- The average selling price of final produce is Rs…….

13. Capacity Utilization

Year	Capacity utilization
Year I	
Year II	
Year III	
Year IV	
Year V onwards	

The project has assumed 60% capacity utilization in the first year, which may be regarded as conservative. The actual capacity utilization may be higher than the projected one.

(**Note: The figures are only tentative and may change depending upon the processing infrastructure capacity and requirements)**

11. Financial Analysis

The projected profitability statement, cash flows and balance sheet of the proposed project of M/S ……. are given below.

1. Projected Profitability Statement

Rs in lacs

Particulars	Ist Yr	2nd Yr	3rd Yr	4th Yr	5th Yr
Sales					
Less- Duty & Taxes					
Net Sales					
Other Income					
Total					
Variable Cost					
Raw Materials Consumed					
Consumables & Packing Materials					
Wages & Salary					
Power					
Repair & Maintenance					
Other Manufacturing Expenses					
Cost of Production					
Add: Opening Stock of Finished Goods					
Less: Closing Stock of Finished Goods					
Cost of Sales					
Gross Profit :-					
Selling & Administrative Expenses					
- Other Selling & Adm. Exps.					
Preliminary Exps W/o					
Profit before Interest & Depreciation					
Depreciation					
Profit before Interest & Taxation					
Interest on					
Term Loan					
Working Capital					
Total Interest					

Particulars	Ist Yr	2nd Yr	3rd Yr	4th Yr	5th Yr
Profit before Taxation					
Current Tax					
Deffered Tax					
Profit after Tax					
Add: Profit B/f from Previous Year					
Balances transfer to Reserve & Surplus					

2. Financial Performance indicators

Year	1	2	3	4	5
Gross Profit Ratio					
Net Profit Ratio					
Current Ratio					
DSCR					
BEP					
Average DSCR					
Project IRR					

The IRR and DSCR of the project look promising and the prospects of the project are supposed to be financially sound.

From the analysis of above indicators, the financial health of the projects seems good. The project is earning good returns and profit margins. The ability of project to re-pay its debt liabilities also looks strong. Moreover, the time series analysis of debt-equity ratio shows that project will be easily able to reduce debt burden from its capital structure.

3. Projected Cash Flow Statement

SL. NO.	PARTICULAR	Ist Yr	2nd Yr	3rd Yr	4th Yr	5th Yr
1	Profit before Tax					
2	Add:- Depereciation					
3	Priliminery Exps. W.O.					
4	**Cash Accurals (1+2+3)**					
5	Receipt of capital subsidy from Bihar Govt.					
6	Increase/(Decrease) in C.L.					
7	Contribution by Shareholder/Promoter					

SL. NO.	PARTICULAR	Ist Yr	2nd Yr	3rd Yr	4th Yr	5th Yr
8	Increase in Term Loan from Bank					
9	Increase in Un. Sec. Loan					
10	Increase in Working Capital					
A.Total (Rs.)(4 to 14)						
1	Preliminary & Preoperative Expenses					
2	Increase in Current Asset					
3	Increase in Cap. Expenditure					
4	Decrease in Term Loan					
5	Investment					
6	Dividend Paid					
7	Income Tax Paid					
B.Total (Rs.) (1 to 9)						
C. Surplus/Deficit from Project (A-B)						
D. Opening Balance of Cash & Cash Equivalent						
E. Closing Balance of Cash & Cash Equivalent(C+D)						
Balance Sheet Cash & Bank						

4. Projected Balance Sheet

Particulars	Ist Yr	2nd Yr	3rd Yr	4th Yr	5th Yr
Liabilities					
Capital					
Reserve & Surplus					
Term Loan					
Bank Borrowing for Working Capital					
Sundry Creditors					
Provision for Taxation					
Total					
Assets					

Particulars	Ist Yr	2nd Yr	3rd Yr	4th Yr	5th Yr
Gross Block					
Less- Accumulated Deprection					
Net Block					
Current Assets					
Inventory					
Raw Materials					
Consumables Stores & Packing Materials					
Closing Stock					
Receivables					
Other Current Assets					
Taxation Advance					
Other Current Assets					
Cash & Bank Balances					
Miscellaneous Expenditure (not w/o)					
Total					

The unit will be equipped with some of the best and modern plant and machinery available today for cold storage. Equipment providers for the unit are reputed firms in their industry. Technology for the unit has been chosen carefully keeping in mind the best practices observed in India.

Note: The figures are only tentative and may change depending upon the processing infrastructure capacity and promoter's requirement.

12. Schedule of Implementation

The total time for implementation of project has been estimated at approximately 6 months. The critical time in completion of project is influenced by:

- Obtaining necessary statutory approval
- Resource mobilization
- Civil construction
- Machinery order
- Installation and commissioning of machinery
- Commercial trial runs

Month-wise schedule of implementation is given below:

Month → / **Activity** ↓	**1**	**2**	**3**	**4**	**5**	**6**
Arranging necessary approvals	■	■				
Civil construction		■	■	■		
Site renovation	■	■	■			
Order for plant and machine		■				
Procurement of plant and machinery			■	■		
Installation of plant and machinery					■	
Trial production						■
Commercial production						■

13. Project Impact

As discussed earlier, the project will have various positive impacts such as:

Infrastructure for value addition: This unit would aim to integrate and streamline existing value chains in the region by creating centralized infrastructure for value addition and preservation. The unit will thus provide benefits on cost, quality and convenience for sustainable growth in the market driven economy. The unit has been envisaged in a way that it would ensure better returns to all players in each level of value chains ranging from procurement, storage, processing, packaging to distribution of food commodities through vertical integration of functions and horizontal linkages of destinations.

Reduction of Wastages: The infrastructure created at the unit along with the integration of backward and forward linkages would lead to more efficient supply chains and reduction of wastages. This would provide higher value realization to all players in the supply chain including the farmers.

Creation of employment: The project shall generate employments. It is estimated that the it would generate direct employment of about 14 workers and indirect employment of another 30 workers. Most of the manpower requirement will be met from the local area.

Return to farmers: The unit will be benefiting farmers in the region by increasing the returns for farmers by decreasing wastages and increasing demand of the agricultural produce.