

PROJECT PROFILE
ON
BANANA RIPENING

MONTH & YEAR
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PREPARED BY
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STIFTUNG **FÜR DIE FREIHEIT**

BANANA RIPENING

INTRODUCTION

Banana ranks third in area with 0.464 million hectare covering 12.46 per cent of the total area. However, it is first in total production (15.07 million tons), being nearly one-third (34.22 per cent) of total fruit production. India occupies first position in banana production globally. Among the states, Tamilnadu ranks first in area and production while productivity is highest in Maharashtra. Most of the banana is produced on a small scale basis in different production systems. The phenomenal increase in production has been due to adoption of high density planting, use of tissue-cultured seedlings and drip irrigation which significantly improved productivity.

POST HARVEST LOSSES

According to National Botanical Research Institute (NBRI), due to improper handling and ripening techniques, Banana of worth Rs.150 crores (25% to 30%) lost every year alone in Tamilnadu.

Losses occur at the following stages:

Harvesting and pre-harvesting: - due to spoilage, spoilage and trimming.

Transport: - due to bruising, breakage and infection as a

result of dust,
heat, rain and humidity.

Storage: - due to over ripening or under ripening.

Processing and packing: - due to inefficiency and contamination.

Marketing: - due to loss of weight and quality with multi-level handling.

The problem is further complicated due to the fact that there are no storage facilities at the farm level and the farmers are forced to dispose off the entire produce immediately on harvesting. Thus, the margins of the wholesalers and retailers are much higher than in the advanced countries.

PRESENT SCENERIAO IN RIPENING

Large quantities of fruits are ripened using calcium carbide which emits harmful substances like phosphor, arsenic leads health hazard. As per PFA (prevention of food adulteration) Act section 44AA, use of carbide is strictly banned. Only safe and worldwide accepted method is using ethylene which is natural hormone for ripening under controlled temperature and relative humidity conditions.

The banana after getting cleaned, packaged and quality checked, needs to be ripened before it arrives to the different retail outlets in order to be purchased by the consumers. The

unit will cater to the post harvest crop management requirement. The firm would require providing ripening facility under controlled conditions for fresh green bananas of appropriate physiological maturity brought from farm or cold room to the ripening chamber.

There is immense need for the establishment of ripening facilities in Tamilnadu state, owing to the large production of banana in the various districts of the State.

Further, the preference of the customers buying the banana is primarily influenced by the spotless yellow color of the banana, apart from its size. Thus there is a need for proper ripening facility of the fruit in order to be sold at the most economical price from the producers' perspective.

In today's world of globalization, customer has become very much quality conscious about the fruits. If fruits properly ripened and displayed in presentable form with attractive color definitely catches the eyes of the buyer.

MARKET POTENTIAL

Agriculture is a significant sector of most of the economy of world. Agriculture derives its importance from the fact that it provides any a country self reliance in terms of food for their people, providing huge direct and indirect employment and more over huge revenue by export of surplus food grain. Agriculture is backbone of the economy and infrastructure for

many countries like India, Brazil and others. Due to technical advancement, improved irrigation system and several other reasons production in agriculture has increased several folds. To meet this increased production and business in agriculture sector an equally reliable supply chain support is imperative. Supply chain is basically-“a set of processes functioning synergistically to satisfy a customer’s demand”. Any supply chain trades off between two main attributes of supply chain, “Efficiency and Responsiveness”. Any supply chain is adopted or designed keeping only this two attributes in mind because it defines about which kind of customer the supply chain wants to cater and what is the scale of “return on investment” is being planned for. Agricultural industry uses both kind of supply chain as per the need.

Designing supply chain for agricultural products:

Most of the produce in agriculture can not be sold directly; as per their mode of consumption they can be categorized as follows-

There are some products which are not highly perishable like cereals but needed to be processed like- rice is polished, and wheat has to be husked.

Some products are highly perishable so they must be sent to market very fast or otherwise needed to be processed and packaged well. For designing a supply chain for any Agriculture product, it’s important to know which kind of

agriculture products is that, and accordingly a responsive or efficient supply chain is designed.

Supply chain for non perishable items:

Most all the cereals like Wheat, Rice, Maize etc. and some vegetables like Potato and Onion are highly inelastic in demand, more over they are not highly perishables so the supply chain for such products should focus more on efficiency and cost effectiveness than responsiveness. These products have vital supply and demand links with the market. Cereals needs some kind of processing and polishing after they are harvested from field and from here onwards supply chain comes into play. The food grain is then packed in jute bags and then stored in cold storages till they get order from market. These type of agricultural products are highly in elastic in demand and the demand more or less remains constant so their demand can easily be forecasted and hence while designing supply chain for such products efficiency should be more preferred.

Supply chain for perishable items:

Fruits, green vegetables and flower come under perishable items and they need all together a more responsive, fast and accountable supply chain as a means of propagation from farms to the market.

These products are elastic and erratic in demand hence their demand forecasting is also difficult. They need more costly type cold storage and refrigeration, special transportation mechanism and on time delivery, all these requirements make this supply chain very costly, but at the same time the price of these products are consummately adjusted to ensure higher margin and profit. While designing supply chain for such items main focus should be given on the responsiveness.

Supply chain management for fruits:

To handle supply chain for these items is a very demanding task. Such products need facilities like refrigerated vans, more efficient cold storage faster transportation. This is the sector where India needs more improvement. India is the second largest producer for both fruits and vegetables, next only to China. Major vegetables include potato, eggplants, tomatoes, cassava, cabbage, dry onions, cauliflower, pumpkin, okra and green peas, while fruits include mangoes, oranges, apples, grapes, pineapples and papaya. So we severely need better support system to handle this massive produce. For example refrigerated vans, the need for refrigerated vans is driven by economics. Every year, India wastes over 30 per cent of the fruits and vegetables owing to shortage of proper cold chain infrastructure. As of today, most of the fruits and vegetables and meat get spoilt by the time they are transported from the farmlands to the retail chains in the cities. The export

potential of fresh fruits, vegetables and dairy sector in India has not been fully tapped considering the size and diversity of these sectors. A poor supply chain is a chief reason behind this. However, India has a negligible share in imports of fruits and vegetables by countries like Australia, Hong Kong, Indonesia, Iran, Japan, Jordan, Republic of Korea, Lebanon, Mongolia, New Zealand, Pakistan, Philippines, Singapore, Syria and Thailand. Considering the level of imports in Asian countries, the study noted that India has a high potential in many Asian markets. Potential fruits identified by the study for increasing the exports include apples, oranges, bananas, watermelon, mandarin, pineapple, mangoes and guavas. Potential vegetables identified by the study include garlic, cauliflower, tomatoes, potatoes, cucumbers, peas, mushrooms, onions and eggplants.

Major problems for fresh fruit and vegetable exports from India include low productivity (cost competitiveness) as compared to global standards, prevalence of a low level of pre-harvest and post-harvest technologies, international quality standards and existence of distortion in market channels and poor supply chain system. Developing region specific export facilitation centers and emphasizing the role of Agri-Export Zones (AEZs) further in tandem with the market requirements, especially to provide a specific thrust to the quality and supply chain requirements of the target markets

Inferences from above

Agriculture is the main stay of the Indian and several other economies of world, it constitutes the backbone of rural livelihood security system and accounts for a handsome percent of GDP of the whole world and if given due support to this industry in terms of better supply chain management system it can certainly provide India or in that manner any agricultural based economy as substantial growth.

Indian farmers lack awareness about market conditions because of poor backward linkages in the distribution chain, and have inadequate access to cold storage facilities, leading to seasonal gluts and extreme price variation. In Delhi, for example, potato prices ranged from Rs 2.9 per kg to Rs 9.5 per kg in a single year. In India, marketing chains are highly fragmented, often with six to eight intermediaries. Farmers tend to receive a small share of the (domestic) consumer price—only about 25 per cent in the case of unprocessed vegetables compared to 40 per cent in developed economies.

The average wastage in the horticulture sector, between the farm-gate and the wholesale level, is around 12 per cent of production. Some of the most demanding standards today are imposed not by foreign governments but by foreign buyers, reflected in warnings and reductions in price and demand. The low average tariff for horticultural products in developed countries is deceptive. There are serious distortions in the

form of minimum entry prices, seasonal variation of tariffs, tariff quotas, preferential access and tariff escalation. The escalating tariff structure in the EU, US, and other countries (for example, Japan and Korea) creates strong disincentives to the export of relatively more processed products.

FRUITS

Area under fruits and overall production has increased dramatically since early 90's. Both have almost doubled in a short span from 1991 to 1997. And the trend continues unabated. This is essentially a capital based high technology venture, which is normally driven by the enterprising genius of medium and large farmers. In the wake of liberalisation from 1991 onwards, several states like Karnataka and Maharashtra have relaxed the provision of Agricultural Land Ceiling Act to encourage horticultural ventures.

Thus, liberating land from the jaws of Agricultural Land Ceiling Act coupled with technology and capital intervention has transformed the farmer from a mere manager of inputs to a powerful entrepreneur of resources during liberalisation decade of 90's. As on today, 5 MH of area is producing around **50 M.T of** fruits of all kinds. By 2011, the expectation expects around 10 MH of area to be producing around **120 MT of fruits**. Leading states would be Andhra Pradesh, Maharashtra, Tamil Nadu, Karnataka, Bihar, Uttar Pradesh and Gujarat.

These seven states would account for more than 70% of fruits output by them.

The overall size of national agricultural basket would grow around 60% by 2011. It includes food grains, animal and agro-industry based and horticultural produce. Population size may grow by 20% by then. Thus, aggregate availability from this composite basket to each family is going to be fairly comfortable – say 33% more than what it is today.

In spite of this, there are number of times that the country has faced glut situation and scarcity in respect of horticultural crops. Some times scarcity has resulted in abundant rise in prices of other surplus produce and farmers had to distress for sale of the produce.

Post harvest losses due to lack of post harvest management infrastructure are estimated 25% of the produce. This means one quarter of what is produced never reaches the consumers for whom it was grown and the money required to produce is loss forever.

Fruits and vegetables are highly perishable commodity. If care is not taken after harvest, they will soon decay and become unfit for human consumption. It has been realized and debated for many years at various levels that the loss has been

occurring for many years due to lack of proper facility especially post harvest management facility. Post harvest handling practices and technologies are become very important due to increase in per capita consumption of fruits and vegetables and purchasing power of urban people.

With the development of proper infrastructure golden quadrilateral schemes, the logistics have become very easier. It is vital that infrastructure to handle fruits and vegetables after harvest to keep it fresh before it is getting consumed. The Government in the recent policy on Second Green Revolution has announced encouragement in terms of subsidies and soft loans for the entrepreneurs who are planning to invest in the sector.

The demand for ready to cook and consume products is becoming more in recent times. Domestic market of these products is very high in the metropolitan cities like Delhi, Calcutta, Chennai, Mumbai, where large number of women is employed. The normal vending outlets added with cold chain can sell the minimally processed and packed products. Minimally processed vegetable have the following advantages:
Maintains freshness and quality

Render vegetables in convenient and “Ready – to - cook form”.
Bulk reduction for better storage, easy transportation and packaging

Extends shelf-life by 3-5 folds

Generates gainful employment at rural and urban level Boosts export of vegetables in minimally processed for Renders 60% value addition to vegetables in unit size consumer package

Low cost technology without involvement of sophisticated machinery

BANANA

India is the second largest producer of fruits in the world and ranks first in the production of banana and mangoes. The country’s annual production is approximately 32 million tonnes, which accounts for 8 per cent of the total fruit production of the world. Nearly 15 million tonnes of banana are produced in India, accounting for over 20 percent of the world’s banana production.

Most fruits soften on ripening and thus are susceptible to injuries during handling or transportation. A ripened fruit, depending on its variety, has a limited shelf life ranging from a few days to one or two weeks. Further, lack of appropriate technology and infrastructure for proper storage and transportation, results in post harvest losses of the agro-produce. In fact, the post harvest losses of fruits in our country are as high as 35-45 per cent. Only a meager 2-3 per

cent of the harvested crop is converted to value added products. In most developed countries, 40-70 per cent of the annual produce is converted to value added products of commercial interest.

Thus, there is an imperative need to develop technologies to overcome post-harvest losses of fruits in India. One way of achieving this could be by developing feasible technologies to extend the post-harvest shelf life. An alternative is value addition of the produce by developing innovative products of consumer interest. While banana is the largest cultivated and the most consumed amongst all Indian fruits, it is also most prone to spoilage and wastage.

Thus, development of a novel technology to make products of consumer interest could have sustainable commercial potential. With this intention Bhabha Atomic Research Centre (BARC) has developed products like banana juice, ripe banana powder and value addition to banana peel.

Unlike other fruits, juice cannot be extracted from banana by simple methods like grinding, crushing or squeezing. This process developed by BARC enables extraction of over 80 per cent of the aqueous content of the fruit as juice from the fruit. The important feature of the process, besides the high yield, is that no external agent like pectolytic enzymes or water is

added for the extraction of fruit juice. Studies reveal that the Harichal variety of banana can yield between 550 to 650 ml juice per kg of pulp processed. This indicates the high commercial potential of the process. Reports available reveal that the microbial enzymes used for extraction of juice are much lower than the amount used for other products.

Banana juice obtained through this process has a specific gravity of 1.07-1.14 and hence has a syrupy look. It has a high sugar content that constitutes 25-35 per cent of the total yield, making the syrup extremely sweet. The solid content of the juice is between 25-27 per cent and has a pH of 4.5-4.8. Banana juice, being a concoction of high potassium, L-DOPA, serotonin, and many other ingredients is well known as one of the best health drinks.

Apart from being used as a health drink, banana juice can be used to make a number of commercially viable products. Diluted juice can be used for the preparation of 'banana nectar' and for the preparation of carbonated beverages. Another product that is being produced successfully is banana wine. The wine prepared from banana juice has a pH of 4-4.5, alcohol content of 6-8 per cent and no higher alcohols or acids were detected by gas chromatographic or High Pressure Liquid Chromatography analysis

.By-Products of banana juice

The process of extracting banana juice also provides a number of commercially marketable by products. Some of these are discussed below:

Ripe banana powder: The leftover pulp of banana has an excellent banana flavour. This pulp is dried and ground to a free flowing powder, which retains the original aroma and taste of the whole fruit. The pulp is used for this process because ripe banana forms a sticky mass on drying. This mass cannot be powdered. Banana powder has a sugar content of 15-20 per cent, insoluble matter of 75-85 per cent and an ash content of 0.7-1.2 per cent.

Banana powder also acts as an excellent basic material for making banana biscuits. The fibre content in such biscuits is 15 times more than that of ordinary biscuits. The powder is also used in preparing banana cake and as an additive in other confectioneries and milkshakes.

Amylase production: The peel comprises 35-40 percent of the weight of a ripened Cavendish banana. This means an accumulation of 35-40 tonnes of peel as waste when 100 tonnes of the fruit is processed. A method has also been developed for the solid state fermentation of banana peels using an amylase-producing organism. India, usually imports this enzyme used for the fermentation process. The enzyme

obtained by solid fermentation of banana peel can be used for industrial purposes after an improvement in the protein concentration. Improvement in protein concentration can be achieved by membrane filtration or by using a high-yielding strain for fermentation. However, studies carried out in this respect are still at a lab-level observation stage and in depth studies are yet to be conducted to ascertain its commercial significance. The determination of amylase specific activity revealed 3000-7000 units/mg/ml enzyme/min with a protein content of 0.2-0.3 mg/ml. In other words, by using 200 gm peel 280 mg amylase could be produced. Therefore, processing of just one tonne of fruit can yield a minimum of 500 kg of amylase.

Present status

As an initial step for large scale production a 1-2 kg bench level process is scale up to 20 kg pulp by modifying the reactor compartment. These studies, being conducted in batch process, require considerable inputs to achieve a continuous flow through the system, from banana peeling to bottling of the juice. However, the studies carried out so far have conclusively proved that banana juice production can be scaled up to a viable commercial level.

Scope

Studies have revealed that banana provides has a huge scope for development of products of commercial interest such as juice and juice based products, powder based products and enzymes. Proper and planned exploitation of this potential can convert the fruit into a cash crop and could have a positive impact on our agro-based economy as well as on rural India.

BANANA RIPENING

Ripening is the process by which fruits attain their desirable flavor, color and textural properties. Climacteric fruits can ripen off the plant once they have reached physiological maturity.

Climacteric fruits include apples, avocado, banana, blueberries, breadfruit, cherimoya, durian, feijoa, fig, guava, kiwifruit, mango, muskmelon, papaya, passion fruit, pears, persimmon, plantain, quince, sapodilla, sapota, sour sop, stone fruits (apricots, nectarines, peaches, plums) and tomato. Some of these fruits if harvested “mature-green”, can be ripened after harvest and short term storage. Pears and bananas are unusual in that they develop the best flavor and texture characteristics when harvested mature-green and ripened off the tree. Avocadoes do not ripen on the tree.

Some climacteric fruits give off large quantities of ethylene during ripening. These include apples, apricots, avocados, cantaloupe, kiwifruit, nectarines, peaches, pears, plums and passion fruit. A small dose of ethylene gas will stimulate other climacteric fruits to begin the ripening process. A few climacteric fruits, such as muskmelons, will not increase in sugar content during ripening, but will soften.

Non-climacteric fruits must ripen on the plant if you want a fully ripe fruit, since once they have been harvested, no further ripening will occur. Flavor and texture will be of low quality if fruits are picked before fully ripe.

Some non-climacteric fruits include berries, cherries, citrus fruits (lemons, limes, oranges, grapefruits, mandarins, and tangerines), cucumber, dates, eggplant, grapes, lychee, okra, peas, peppers, pineapple, pomegranates, strawberry, summer squash, tamarillo and watermelon. Non-climacteric fruits will not respond to attempts to ripen them with ethylene gas. A partially red strawberry, for example, will not develop any more color or sweetness after being picked, and will deteriorate faster if exposed to ethylene. Watermelons develop most of their sweetness during the week before they reach full maturity, making early harvest very undesirable.

Sometimes ripening commodities before sale at the wholesale or retail level will improve their value. Ripening rooms are often used for tomatoes, citrus fruits and bananas. The use of diluted ethylene gas mixtures is safer than using pure ethylene which is explosive and flammable at concentrations of 3% or higher.

For tomatoes, technical grade ethylene gas is introduced into the room at a concentration of about 100 ppm for about 48 hours. Approximately 0.25 cubic feet/hr of ethylene gas is required for each 1000 cubic feet of ripening room volume. A small fan can be used to ensure a uniform continuous flow of ethylene into and through the room. Forced-air ripening is increasingly being used to provide more uniform temperatures and ethylene concentrations throughout the ripening room.

India produces and consume lot of bananas

It is estimated that 40% of Bananas wasted during the supply chain Ripening is done in Crude way using Calcium Carbide

Ripening Chambers are constructed without good results

Too good in copying but actually copying mistakes

No training for the ripeners

MARKETING ARRANGEMENTS

The banana ripening capacity will be utilized by Banana traders and local farmers.

INSTALLED CAPACITY

Banana Ripening

The banana ripening capacity of the unit proposed is 10 tonnes of banana per day would be created. Every day 10 tonnes would be taken out after ripening. On this basis 3000 tonnes is envisaged for the whole year.

Banana ripening facility can be utilized for ripening for job works and also for the ripening of own.

PROCESS

Ethylene gas used for ripening most of the climacteric fruits like Banana, Mango, Papaya, etc under controlled condition of temperature, humidity and ethylene concentration in air tight, ethylene proof room.

Ethylene being natural hormone does not pose any health hazard for fruits and also being degreening agent which turn out peel from green to perfect yellow and maintain sweetness and aroma of fruit thus value addition in fruit is possible.

Ripening technology allows:

Proven world wide technically and commercially

Wastage reduction from 40 to 5%

Increase in Retail Sales – the Driver

Less handling all in Cartons, Boxes

The need for ripening were due to

Guaranteed constant quality

Reliable quality control ensured during the total process

While ripening the product produces

Ethylene

Respiration, production of CO₂

Solubilization of the pectin substances, softening of the pulp

Starch hydrolysis into sugars

Organic acids and volatiles (350 different components).

While controlling the ripening process, it ensures

Shelf life Colour

Taste

Attractive & Shiny

Clean, free of defects

The important things to be noted before ripening the banana are the following

Need to know type of banana

Origin of Banana

Requirement of Customers (Food retailer, Agri Co-operatives etc)

Specific ripening method depends on the above parameters

What is the ideal ripening room?

Gas tight (to maintain ethylene in the room to have even colors)

High Humidity 85-95% (Less weight loss, Longer shelf life)

Even airflow and pressure (Even colors and temperatures)

Even temperatures

Temperature control by measuring banana temperatures.

Analog controller.

PLANT AND MACHINERY

The following machinery items are required for the project.

Ripening Chambers Qty : 6 Chambers of 10 mt capacity each.

S No.	Description	Total Qty.
1	Condensing unit: Hermetic air cooled condensing unit, connected with all safeties mounted on common base frame. Refrigeration Capacity : 18 Kw Power Consumption : 5.8 kw Refrigerant : R134a	6
2	Evaporator: Air cooler with suitable capacity to maintain room temperature. Capacity : 18 Kw Chamber temp. : 6to 16 deg c Defrosting : Air defrosting Air volume : 20000 cmh	6
3	Humidifier: Type : Adiabatic type	6

	Capacity : 3 kgs per hr	
4	Ventilation system to for C02 evacuation with exhaust fans with auto control	6
5	Refrigerant Controls: Solenoid valve Filter Drier and Sight Glass Thermostatic expansion valve d) isolation valves	6 sets
6	Microprocessor Controller for Temperature and Humidity Digital Temperature, Indicator cum Controller for Compressor Management and automatic Defrosting of the air coolers. The Humidity indicator and controller maintains the humidity and controls the humidifier.	6 sets
7	Ripening System and controller Portable Ripening Generator necessary contro to maintain the set PPM levels	4
8	Electrical Panel : Electrical Starter Panel for Compressor , condenser fand and Air cooler fans includes necessary all safeties and overload relays	1 sets
9	Refrigerant pipes and fitting with Cu for Suction and liquid line connections, includes suction line insulation and drain connection with hard pvc	Lot

	pipes. 15 m considered per system	
10	Refrigerant Gas charge for testing and commissioning	Lot
11	Labor for Installation, testing & commissioning	1
12	Consultant charges for construction of ripening chambers	1
	Other Accessories : a) Total no. of chambers : 6 b) Pallets : 16 / room x 6 nos , 1000 Rs/pallet c) Plastic crates ; 35 nos/ pallet x 16 / room x 6 rooms 3360 per cycle but requires minimum 5000 crates x 300 Rs/crate	

The total cost of machines including the pallets and crates is estimate at Rs.54.00 lakhs

RAW MATERIALS AND PACKING MATERIALS

While doing the job work on banana ripening the materials will be supplied by the parties, generally traders who entrust the job work for ripening. The consumables such as ethylene can be obtained from authorized dealers.

LOCATION, LAND AND BUILDING

Land required	25000 sq.ft – about half an acre would be sufficient.
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Building	750 sqm for Ripening rooms and handling - 250 sqm covered shed for processing Green banana Washing ,cleaning , weighing and palletizing
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UTILITIES

POWER:

The total requirement of power for the unit is around 36 HP. This can be made available form the local electricity Board. As a standby arrangement, a generator with a capacity of 62.5 KVA is provided in the project.’

WATER:

The daily water requirement for washing will be about 5000 litres of water. This can be made available from the bore wells to be provided at the site.

MANPOWER:

The unit requires the following manpower.

Category	Nos.	Monthly Salary	Total monthly Salary
Supervisor	1	9000	9000
Skilled	2	8000	16000
Helpers	2	5000	10000
Clerk	1	6000	6000
Security	3	5000	<u>41000</u>

Add : Benefits	20%	8200
Total		<u>49200</u>
Total wages per annum		
	[Rs.lakhs]	Rs.5.90 lakhs

SCHEDULE OF IMPLEMENTATION

After finalizing the arrangements for finance the project can be started within six months

COST AND PROFITABILITY

Installed capacity	Banana Ripening 3000 MTs per annum (10 MTs per day) – Job work 100%-
Capacity utilisation	Year-1- 60% Year-2-70% Year-3- 80%
Job rate for Banana Ripening	Banana Ripening Job work Rs.2000 per MT
Consumables	Rs.50 per MT
Power	Rs.10.64 lakhs at 100%
Wages & salaries	Rs.5.90 lakhs per annum
Repairs & maintenance	Rs.1.20 lakhs per annum with 5% increase every year.
Depreciation	Written down value method
Selling general and Administrative expenses	Rs.20000 per month (Rs.2.40 lakhs per annum) for the first year with an increase by 3% every year.

Interest on Term loan	14% per annum
Interest on working capital	Nil
Income tax	34% per annum.

LIST OF MACHINERY SUPPLIERS

1. Jaimin Engineering Pvt. Ltd.

Plot No. 13; Survey No. 166, Near Shantidham, Veraval
(Shapar), Rajkot - 360024, Gujarat.

MATERIAL SUPPLIERS

Local banana traders and farmers

1. Voltas Ltd

New No: 624 Old No: 503

Anna Salai

Teynampet

Chennai-600018

Phone: 044-24344572

Cell: 9444079020

2. Family Farms Agritech Pvt Ltd

Greater Kailash

New Delhi-110048

3. Isopa Insulations Pvt Ltd

7.11/901 Vipul Greens

Sohna Road

Gurgaon

Haryana -122003

4. Blue Star Ltd

Plot No: 4, 5

GIDC Industrial Estate

Narmada Nagar Post

Bharuch -392015

5. Sri Sai Fibres Pvt Ltd

1-5-16/5B/1 Mushheerabad

Hyderabad-500 080.

FINANCIAL ASPECTS

1. COST OF PROJECT

	[Rs.lakhs]
Land	20.00
Building	50.00
Plant & Machinery	54.00
Technical know how fees	0.00
Other Misc. assets	5.00
Pre-Operative expenses	10.00
Margin for WC	0.80
	<hr/>
	139.80

2. MEANS OF FINANCE

Capital	41.80
Subsidy	24.00
Term Loan	74.00
	<hr/>
	139.80

Subsidy is Rs.1.00 per MT –for 6 chambers of 10 MTs Rs.60.00 lakhs subject to maximum of 40% from National Horticulture Board. Rs24.00 lakhs

3. COST OF PRODUCTION & PROFITABILITY STATEMENT

Years	[Rs.lakhs]		
	1	2	3
Installed Capacity (MT)	3000	3000	3000
Utilisation	70%	80%	90%
Production/Sales (MT)	2100	2400	2700
Job Charges for Banana Ripening	Rs.2,000		
Total Income (Rs.lakhs)	42.00	48.00	54.00
Raw Materials	0.00	0.00	0.00
Packing materials	1.05	1.20	1.35
Power & fuel	4.47	5.11	5.75
Wages & Salaries	5.90	6.20	6.51
Repairs & Maintenance	1.20	1.32	1.45
Depreciation	8.60	7.34	6.26
Cost of Production	21.22	21.17	21.32
Admin. & General expenses	1.20	1.26	1.32
Selling expenses	0.00	0.00	0.00
Interest on Term Loan	10.36	9.07	6.48
Interest on Working Capital	0.00	0.00	0.00
Total	32.78	31.50	29.12
Profit Before Tax	9.22	16.50	24.88
Provision for tax	3.13	5.61	8.46
Profit After Tax	6.08	10.89	16.42
Add:			
Depreciation	8.60	7.34	6.26
Cash Accruals	14.68	18.23	22.68

4. WORKING CAPITAL:

	Months Consumptions	Values	%	Margin Amount	Bank Finance
Raw Materials	1.00	0.00	25%	0.00	0.00
Finished goods	0.25	0.00	25%	0.00	0.00
Debtors	1.00	3.50	10%	0.35	3.15
Expenses	1.00	0.45	100%	0.45	0.00
		<u>3.95</u>		<u>0.80</u>	<u>3.15</u>

5. PROFITABILITY RATIOS BASED ON 80% UTILISATION

$$\frac{\text{Profit after Tax}}{\text{Sales}} = \frac{16.42}{54.00} \quad 30\%$$

$$\frac{\text{Profit before Interest and Tax}}{\text{Total Investment}} = \frac{31.36}{142.95} \quad 22\%$$

$$\frac{\text{Profit after Tax}}{\text{Promoters Capital}} = \frac{16.42}{41.80} \quad 39\%$$

6. BREAK EVEN LEVEL

Fixed Cost (FC):

	[Rs.lakhs]
Wages & Salaries	6.51
Repairs & Maintenance	1.45
Depreciation	6.26
Admin. & General expenses	1.32
Interest on TL	6.48
	<u>22.02</u>

Profit Before Tax (P)

24.88

$$\text{BEL} = \frac{\frac{\text{FC}}{\text{FC} + \text{P}} \times 100}{\frac{22.02}{46.90}} \times \frac{90}{100} \times 100$$

42% of installed capacity