

Sector	Agro and Food Processing
Sub - sector	Agri-infrastructure
Project No	AF- 01
Project/Product	Pack-house Project for Banana

Project Description

Banana pack house project will provide all the technical facilities for pre and post harvest procedures, so as to maintain consistent quality for export of the product. These facilities can also be used for supply of high quality Bananas in the domestic market and to Banana processing units in Gujarat.

The proposed unit will have tie-up for Banana procurement from the farms, and will facilitate Banana sorting, grading, cleaning line, Banana pre-cooling, Controlled atmosphere Banana cold storage, Banana ripening chambers and refer transportation system for Banana supply to export market or to the exporting sea ports till the material is loaded in refer sea containers for exports.

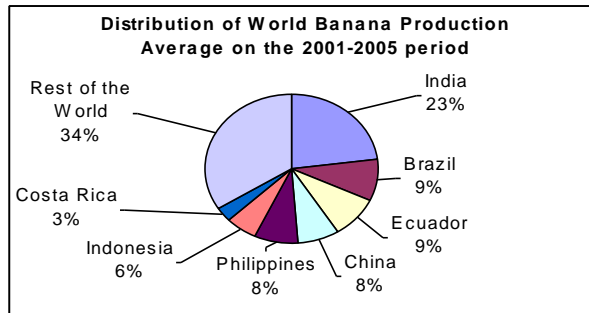
Mechanized Banana handling system using wire rope conveyors for hand collection of green banana from the farm can also be included as project component, where large quantity of green bananas have to be hand picked from an area deprived of direct access to plantation or requires movement through high density plantation.

Project Concept

The proposed project is an important link in the complete Supply Chain Management of Banana marketing in export and domestic markets, while providing necessary support to Banana growers of particular area for the development of Banana markets. The project will provide required impetus in the form of physical infrastructure and technological input to the Banana growers and exporters, which in turn will develop good quality banana that can be exported from the region.

Market & Growth Drivers

- Global production of Banana in the year 2004 was estimated at around 70 million tons. India is one among the 10 major banana producing countries which together accounted for about 75% of total World banana production in the year 2004. Production as well as trading of Bananas is highly concentrated in a few Asian and Latin American countries. This concentration of banana production has intensified over a period of time and is showing a different regional distribution.
- The Latin American and Caribbean region dominated Banana Production up to eighties, while the Asian region took the lead in Banana production during the nineties. African production levels have remained relatively stable during that period. Distribution of World Banana production as per FAO statistics, between 2001 to 2005 is graphically shown in the following figure.



Source: Food and Agriculture Organization of the United States (FAO)

- India contributed 23% to the global banana production and 11% to the total area under cultivation. Rising Banana productivity in Gujarat as well as India is becoming a matter of concern for post harvest facility of storage and handling.
- The major countries to which India exports banana are U.K., Saudi Arabia, Kuwait, UAE, Oman, Qatar, and Yemen Arab Republic.
- Technological change by the developed countries in the post harvest storage methodology boosted global banana trade which registered rapid growth in the last few years and has reached INR 436 billion.

Banana Trade Statistics

Sr. No	Years	Quantity (MT)	Value (INR Lacs)
1	2003-2004	1426.41	166.21
2	2004-2005	924.41	61.65
3	2005-2006	2033.8	199.23
4	2006-2007(Apr- Jun)	1740.31	200.48

Source: Department of commerce, Government of India

Growth Drivers

- India does not export even 1% of the total banana production and thus, there is a vast potential for increasing this quantity, provided a Banana pack house system comes up.
- Indian Banana production has increased substantially in the last few years, due to increased adoption of tissue culture plants which gives higher yield, consistent quality and production for longer period of year.
- There is a huge potential for export to EU countries and CIS countries. India already exports Bananas to Germany, France, U.K., but still needs to go a long way to meet strict quality standards.

Why Gujarat?

- In India, Gujarat is one of the leading states in banana production, with the highest productivity of 40 MT/ ha. The State production in the year 2004-05 was 1.98 million tons and is expected to grow with availability of canal irrigation & adoption of tissue culture plants as planting material.
- Government of Gujarat, being aware of the current situation of Banana export, offers 6% back end interest subsidy with a ceiling of INR 4000 million for Banana Pack house project.
- Gujarat has availability of technically trained man power for pack house operation at economical cost.
- Gujarat has well developed transport infrastructure facilities like rail & road network and availability of world class ports like Kandla, Mundra and Pipavav having required container cargo handling facilities.

Raw Materials

The Area and production of Bananas in Gujarat for the last 5 years period are summarized in the following Table:

Area and Production of Bananas in Gujarat

Sr. No.	Year	Area ('00 Hectares)	Production (MT)
1	2001-02	33139	1154330
2	2002-03	35187	1403077
3	2003-04	42909	1760901
4	2004-05	46347	1979257
5	2005-06	49234	2498776

Source: Department of Horticulture Statistics, Gandhinagar, Government of Gujarat

As observed from the above table Banana production in Gujarat has seen an escalating trend, in terms of area and production in the last five years. This production increase can be attributed to enhancement in average yield per hectare.

The major Banana producing districts considering area under cultivation and production are Anand, Surat, Baroda, Bharuch, Narmada and Kheda.

Technology / Process

Being a core infrastructure project it will require Banana procurement system from farms, then cleaning, sorting, grading, packing line and pre-cooling them under controlled atmosphere cold storage, with Banana ripening and Logistic system to carry them to ports.

In case the operational area of the proposed pack house is having more than 40 km periphery, it is suggested to have mobile pre-coolers so as to eliminate any damage to the crop from farm heat before being brought to the pack house. Mechanized Banana handling system, as used in Latin

American countries, can also be planned, where Banana hands have to be picked from large farm areas or from Banana farms which cannot be approached due to high density.

In Gujarat, the horticulture department as well as the state agriculture universities would provide necessary extension services and technological inputs to the farmers or their co-operatives, for getting quality Banana crop from the region.

Suggested Project Capacity and Project Cost

The proposed Banana pack-house would have capacity of handling and storing 1000 MT of Banana at any point of time. It would be equipped with a ripening chamber to cater to the need of the domestic market. The proposed pack-house would store Bananas for the duration of 2-3 months.

The estimated project cost would be INR 45 million (US \$ 1 million).

Estimated Project cost & Means of finance

Sr. No.	Cost of project	INR in million
1	Land and Land development	3.00
2	Building	10.00
3	Plant & Machinery (1000 MT Storage)	19.00
4	Misc. Fixed Assets	2.50
5	Preliminary & preoperative incl. technology	2.50
6	Provision for contingencies	2.00
	Fixed Capital cost	39.00
7	Margin Money for working capital	6.00
	Estimated Block Capital Cost of Project	45.00
	Means of Finance	
8	Promoters contribution (Debt equity ratio is 2.5:1)	15.00
9	Term loan	30.00
	Total Means of Finance	45.00

As indicated above, the proposed project will require an approx 6000 sq. mt of land with an proposed built up area of 2000 sq. mt. The Banana pack house unit is proposed to have storage capacity of 1000 MT and considering 3 storage cycles in a year its effective storage capacity will be 3000 MT per annum. The total fixed cost of the project is estimated at INR 39 million and INR 6 million is the working capital margin, which will make total block capital cost to INR 45 million. The unit being proposed to cater to domestic as well as International demand, is suggested to have a Debt equity ratio of 2:1. Thus, the estimated term loan amounts to INR 30 million and Equity at INR 15 million.

Suggested Location

Banana pack-house could be set up at various places in Central and South Gujarat Regions in the district of Kheda, Anand, Part of Panchmahal, Vadodara, Surat, Narmada, Bharuch, and Valsad.

Plant and Machinery

The list of main plant and machineries for the proposed Banana pack house is summarized in the following table:

List of Plant and Machinery

Sr.No.	Particulars	Quantity	Supplier
1	Banana Brush washer	2	Global Agri Tech Engineer, Vadodara Process Masters, MIDC Pimpri, Pune- Maharashtra
2	Banana Inspection Conveyors	1	Global Agri Tech Engineer, Vadodara
3	Pre coolers and Pre cooling chambers 25 MT / day	4	Frick India Ltd, New Delhi & Mumbai
4	Banana Cold Storage 250 MT each	4	Frick India Ltd, New Delhi & Mumbai
5	Banana Ripening chambers 10 MT each	3	“Lock Sock” Ravin Impex (P) Ltd, Ahmedabad-380009
6	Heavy duty Plastic crates for Banana storage and handling	20000	Neelkamal Plastics Mumbai
7	Ammonia Compressors for Pre cooling and Cold Storage	4	Frick India Ltd, New Delhi & Mumbai
8	Atmospheric condensers	2	Frick India Ltd, New Delhi & Mumbai
9	HT / LT Electrical system with DG set for stand by power	Lot	Kirloskar Electricals Ltd-Ahmedabad
10	Pallet handling truck	1	Godrej & Boyce Ltd, Mumbai
11	Refer insulated vans for transport of Banana from farms & to market	2	Tata Motors /Ashok Leyland & Carrier Aircon Ltd-Delhi

Utilities

The proposed Banana pack house will have electrical connected load of 120 HP and utilization will be approx.80 HP on a regular basis. The unit will require approx.20 KL water for Banana cleaning and cooling system of refrigeration unit proposed for pre-cooling and cold storage unit.

Man power required

The proposed project will have total manpower requirement of 20 persons. This will include 3 managerial posts, 3 supervisory posts, 6 operators, 3 engineering maintenance staff like electrician, mechanical foremen and 5 accounts, administrative and security staff.

Project Time Line

The proposed project will have cumulative implementation period of 10 - 12months of which 5 to 6 months would entail obtaining the required clearances from various authorities

Financial Indicators

Based on the profitability projections worked out for the proposed project, key financial indicators are as summarized below:

Key Financial Indicators

Sr. No.	Particulars	1 st Year	2 nd Year	3 rd Year
A	Break-Even Point	53.4%	41.0%	30.1%
B	Debt-service Coverage Ratio	1.50	1.96	2.83
C	Average DSCR	2.10		
D	Return on Investment (ROI)	26.9%	46.4%	68.1%
E	IRR	26%		

As perceived from the Project cost and Means of finance table, the suggested Debt Equity Ratio for the proposed project is 2:1. The IRR (Internal Rate of Return) for the proposed project is approx. 26% projected for a period of 10 years.

Clearances Required

Filing of Industrial Entrepreneur's Memorandum (IEM) with the Secretariat of Industrial Approvals (SIA), Department of Industrial Development, Ministry of Industry, New Delhi.

Registration with Ministry of Food Processing Industries (MOFPI), through state nodal agency GAIC, to avail benefits of scheme for food processing industry - under Agri Infrastructure Project category

Approach state office of National Horticulture Board for availing incentives under the scheme for Banana Pack house and other post harvest infrastructure facilities including cold chain transportation

Critical Aspects

It is very much important to examine critical aspects of such project at the planning stage to overcome main hurdles of the project and to undertake successful implementation. These are as under:

The Success of such export oriented pack house is contingent on consistent supply of good export quality materials in required quantity, as per international standards.

To achieve smooth exports, clearly defining the pre-harvest and post harvest procedures, Quality norms for different markets, training of growers, field staff and pack house staff regarding quality standards are very vital.

Efficient operation of post harvest facilities at pack house as well as transit handling system for economical operation is important.

Development of good vendors for supply of packing cartons, Ethylene gas, regular service of post harvest equipments and reefer transportation vehicles, and stand by utility supply equipments.

Agencies to be Contacted

Industrial Extension Bureau

Gujarat Agro Industries Corporation Ltd.

Mott MacDonald India