

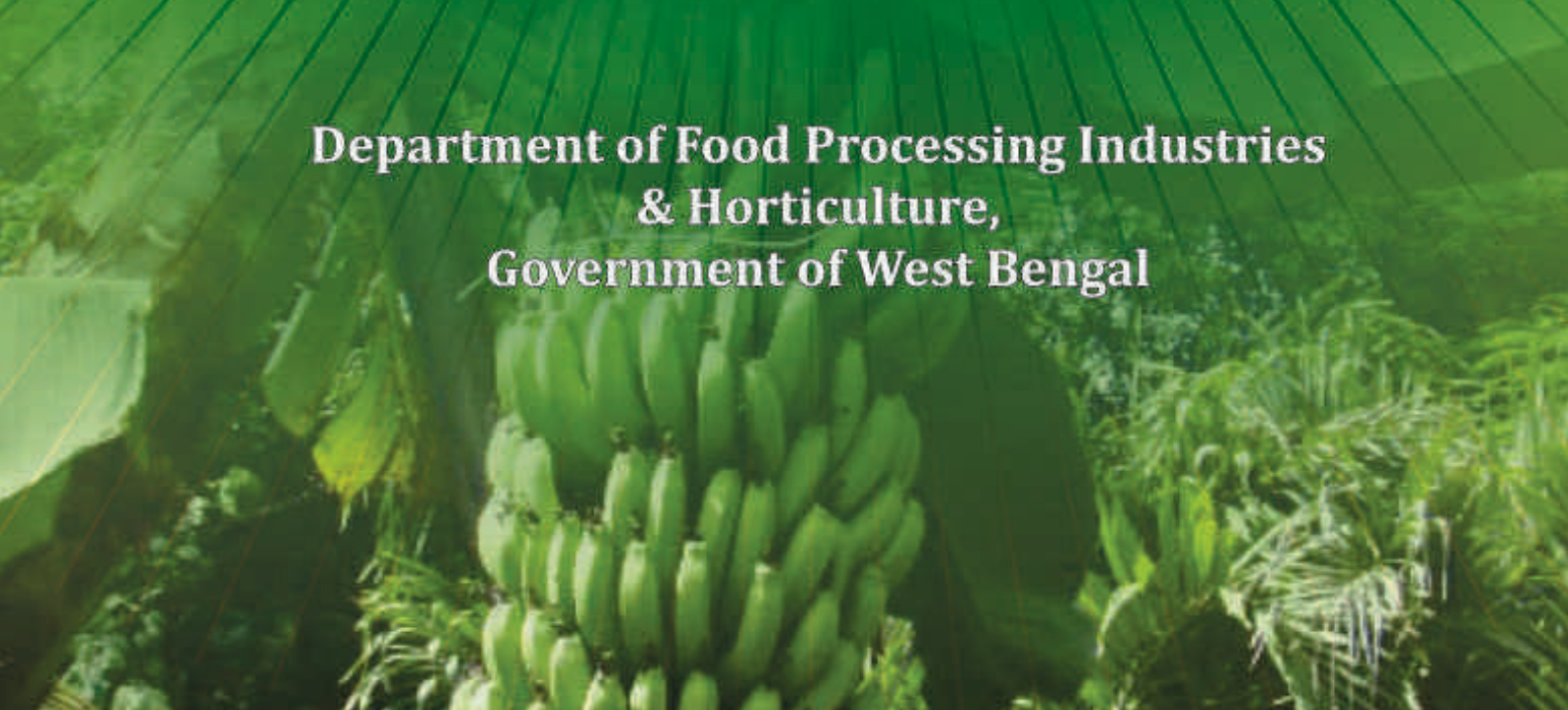


सत्यमेव जयते

Government of India

FEASIBILITY STUDY OF BANANA PROCESSING UNIT IN WEST BENGAL

**Department of Food Processing Industries
& Horticulture,
Government of West Bengal**





Confederation of Indian Industry

Feasibility Study of Banana Processing Unit in West Bengal

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FOREWORD

The last three decades witnessed India making significant strides in the Agriculture and Food processing Sector. The success achieved by the country was the result of the Indian farmer matching domestic demand and creating surplus with corresponding increase in the yield despite structural barriers. Though India is now the world's third largest agricultural producer by value, it still has a long way to go before it realizes its full potential leaving a huge scope for value addition in agriculture.

According to the FAIDA -III report, the domestic demand for food is expected to grow at 4 per cent per annum in the next 15 to 20 years and the growth will be much higher (5 to 6 per cent) across high value food items, such as animal products and fruits and vegetables (6 to 8 per cent)¹.

India's geographical situation gives it the unique advantage of connectivity to Europe, the Middle East, Japan, Singapore, Thailand, Malaysia and Korea. One such example indicating India's location advantage is the value of trade in agriculture and processed food between India and Gulf region.

India is the largest producer of banana in the world and about 90% of banana produced is consumed domestically as fresh fruit. Merely 5% is consumed in processed form providing a good potential for future processing. About 2.5% is only processed purely as banana products and the rest as an ingredient in other foods. About 17 varieties of products could be made from banana. The primary product of banana in market is "fried chips and candy" which constitute around 31%, rest as banana puree 9%, banana pulp 3%, banana beer 3%, banana wafers 3%, banana powder 6% and others².

Being a highly perishable in nature, value addition of banana into figs, flour, powder, banana chips, synthetic and natural flavoring to energy drinks could help cater the changing tastes and rising demand for value added ready-to-eat products. With different levels of processing (viz. primary, secondary, tertiary levels) including drying procedure or frying procedure, the nutritional value of banana can help serve multiple nutritional needs.

This report focuses on the techno economic feasibility of setting up banana processing industry in districts of West Bengal and provides a roadmap for its execution to prospective MSM (Micro, small & medium) sector entrepreneurs. It also highlights the market opportunity using Banana as the content for processing. The report looks at approvals in setting up of processing industry and provides the technical and financial analysis including key parameters viz. IRR and NPV.

Confederation of Indian Industry (CII) Food and Agriculture Centre of Excellence (FACE) New Delhi with the support of Keventer's Agro Ltd has developed this report for the Department of Food Processing Industries (DFPI), Government of West Bengal.

¹FAIDA 3, 2013 : Indian as an Agriculture & high Value Food Power house a new vision for 2030

²Rashmi SB, Jyothsna V (2011) Rural entrepreneurship: exploring the opportunities from waste products of bananas plant in Karnataka. International Journal of Research in Computer Application & Management 1: 105-107.

SECTION 1. INTRODUCTION

1.1. Status of Agriculture and Value Addition to Agriculture in India

Agriculture plays a critical role in Indian economy. Food grain production estimated for the current year is 263 million tonnes compared to 255.36 million tonnes in 2012-13. With agriculture export likely to cross USD 45 billion higher from USD 41 billion in 2012-13, Agricultural GDP growth for the current year is estimated at 4.6 percent compared to 4.0 percent in the last four years. (Interim Budget 2014-15). India accounts for only about 2.4 % of the world's geographical area and 4 % of its water resources, but has to support about 17 % of the world's human population and 15 % of the livestock³.

Accelerating the growth of agriculture production is therefore necessary not only to achieve an overall GDP target of 8 per cent during the 12th Plan and meet the rising demand for food, but also to increase incomes of those dependent on agriculture to ensure inclusiveness.

The experience from BRICS countries indicates that a one percentage growth in agriculture is at least two to three times more effective in reducing poverty than the same growth emanating from non-agriculture sectors.

India's food production index is the highest among the BRIC (i.e. Brazil, Russia, India, and China) countries and the Philippines⁴. The Philippines rising food retail sales and innovations in processed foods and fruits have gained attention in recent years. Moving hand in hand with the country's food production, value addition to agriculture (as a percentage of GDP) is also found to be the highest among these identified countries. As per the World Bank's World Development Indicators, India's value addition to agriculture is above 17 percent and has held this level since 2010.

Table: 1

BRICs and Philippines	Country Name	2005	2010	2011	2012
Indicator Name					
Food production index (2004-2006 = 100)	Brazil	99.4	123.9	129.2	
	China	100.4	120.2	124.2	
	India	100.0	123.4	131.0	
	Philippines	100.1	113.0	115.9	
	Russian Federation	99.6	104.0	117.8	
Agriculture, value added (% of GDP)	Brazil	5.71	5.30	5.46	5.24
	China	12.12	10.10	10.04	10.09
	India	18.81	17.98	17.55	17.39
	Philippines	12.66	12.31	12.72	11.84
	Russian Federation	4.97	3.87	4.36	3.87

³Report on State of Indian Agriculture 2012-13, GOI

⁴<http://www.euromonitor.com/frozen-processed-food-in-the-philippines/report>

Agriculture value added per worker (constant 2005 US\$)	Brazil	3477.61	4705.83	5019.42	5035.23
	China	541.11	680.86	713.28	749.42
	India	564.85	640.93	657.08	662.51
	Philippines	1010.85	1081.43	1103.85	1129.00
	Russian Federation	4726.74	5135.81	6041.68	5968.63

Source: data.worldbank.org/indicator/EA.PRD.AGRI.KD/countries

Value addition in Agriculture/Food processing sector forms a significant segment of the Indian economy in terms of its contribution to GDP, employment and investment. The sector contributes as much as 9-10% of GDP in agriculture and manufacturing sector,. During the last five years ending 2010-11 food processing sector has been growing at an average annual growth rate of around 6 % as compared to around 4 % in agriculture and 9 % in Manufacturing⁵.

1.2. Status of Banana Production: Global, India, West Bengal

Banana is grown in more than 130 countries. FAO 2012 estimates report the production of these countries collectively stands at 105.32 million tons of banana and plantain⁶ with 5.14 million Ha of land under cultivation to achieve this level of production. In 2009, world production of bananas reached an estimated 97.3 million metric tonnes (mmt), grown on 4.9 million hectares. The 2009 crop represented an increase in production of 49 percent from the 65.1 mmt recorded in 2000. The top five banana-producing countries of India, the Philippines, China, Ecuador, and Brazil accounted for 61 percent of global banana production in 2009, up from 56 percent in 2000. In addition, there were noticeable production increases in India and the Philippines.

Table: 2 Major producing countries of Banana in the world (2010)

Country	Area(000'ha)	Production(000'MT)	Productivity (Mt/ha)	% Share in World total Production
India	830	29780	35.88	29.19
China	373.45	9848.9	26.37	9.65
Philippines	449.61	9101.34	20.24	8.92
Ecuador	215.65	7931.06	36.78	7.77
Brazil	486.99	6962.79	14.3	6.82
Indonesia	101.28	5755.07	56.83	5.64
O t h e r Countries	2557.09	32649.02	113.07	32
World Total	5014.6	102028.17	20.35	100

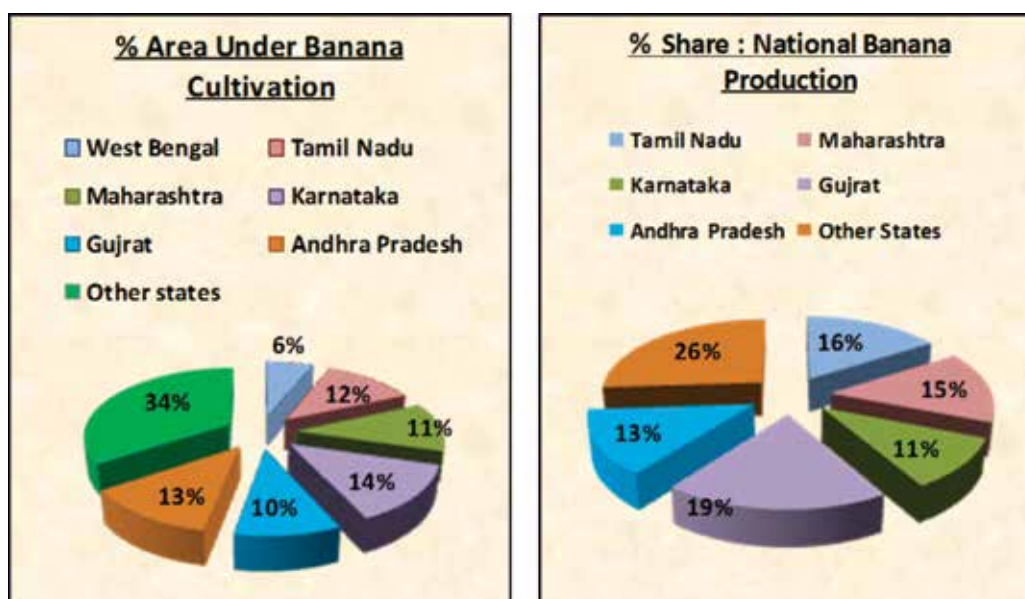
Source: FAO, 2010

⁵Annual Report 2012-13 , Ministry of Food processing Industries

⁶The difference between the two terms “plantain” and “banana”, used here, is based purely on how the fruits are consumed. Plantains are typically eaten cooked and are usually large, angular and starchy, in contrast to bananas, which are typically eaten raw and are usually smaller, more rounded and sugary.

India is the largest producer of banana in the world accounting for 37.2 per cent of world's banana production with an annual production of about 248.69 lacs MT/year (NHB Advance Estimates 2012-13) and the crop occupying about 7.21 lacs hectares of agricultural area (NHB Advance Estimates 2012-13). It accounts for 32 per cent of the total fruit production (NHB Advance Estimates 2012-13).

Among the banana growing states in India, Gujarat is the leading producer with an annual production of 45.23 MT (NHB Advance Estimates 2012-13) followed by Tamil Nadu, Maharashtra, Andhra Pradesh, Karnataka and West Bengal. Fruit cultivation occurs along the major river Basins viz., Gangetic plains of Bihar, around Godavari river basin in Andhra Pradesh, around Tapti River in Maharashtra and Cauvery delta regions of Tamil Nadu; where Water/rainfall is plentiful.



Source: (NHB Advance Estimates 2012-13)

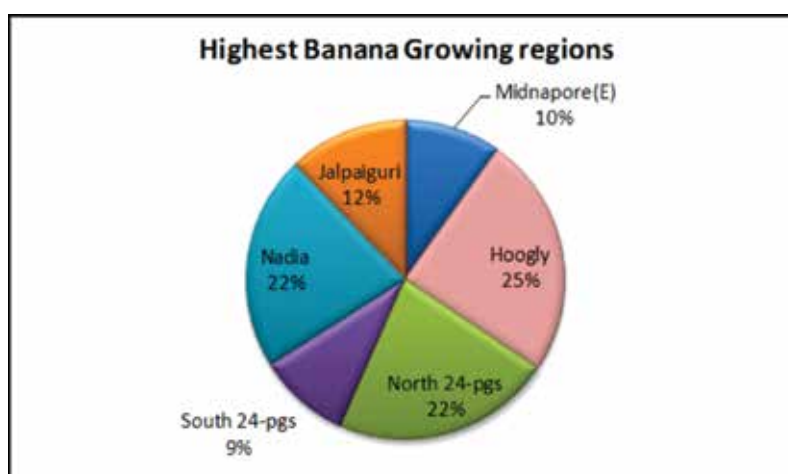
Important banana varieties cultivated in different states of India are given below:

State	Varieties grown
Andhra Pradesh	Dwarf Cavendish, Robusta, Rasthali, Amritpant, Thellachakrakeli, Karpooa Poovan, Chakrakeli, Monthan and Yenagu Bontha
Assam	Jahaji (Dwarf Cavendish), Chini Champa, Malbhog, Borjahaji (Robusta), Honda, Manjahaji, Chinia (Manohar), Kanchkol, Bhimkol, Jatikol, Digjowa, Kulpait, Bharat Moni
Bihar	Dwarf Cavendish, Alpon, Chinia, Chini Champa, Malbhig, Muthia, Kothia, Gauria
Gujarat	Dwarf Cavendish, Lacatan, Harichal (Lokhandi), Gandevi Selection, Basrai, Robusta, G-9, Harichal, Shrimati
Jharkhand	Basrai, Singapuri
Karnataka	Dwarf Cavendish, Robusta, Rasthali, Poovan, Monthan, Elakkibale

Kerala	Nendran (Plantain), Palayankodan (Poovan), Rasthali, Monthan, Red Banana, Robusta
Madhya Pradesh	Basrai
Maharashtra	Dwarf Cavendish, Basrai, Robusta, Lal Velchi, Safed Velchi, Rajeli Nendran, Grand Naine, Shreemanti, Red Banana
Orissa	Dwarf Cavendish, Robusta, Champa, Patkapura (Rasthali)
Tamil Nadu	Virupakshi, Robusta, Rad Banana, Poovan, Rasthali, Nendran, Monthan, Karpuravalli, Sakakai, Peyan, Matti
West Bengal	Champa, Mortman, Dwarf Cavendish, Giant Governor, Kanthali, Singapuri

Source: National Horticulture Board

Agriculture plays a significant role in the West Bengal economy contributing 12.9% of state GSDP⁷ (2012-13, Gross State Domestic Product). West Bengal's production of Banana contributes 4% to India's annual production⁸ in 2012-13. West Bengal is one of the largest Banana producing states in India with an annual production estimated to be 10.77 lacs MT/year. Hoogly, Nadia and North 24 Parganas regions in West Bengal produce Dwarf Cavendish, Champa, Mortman, Rasthali, Amrit Sagar, Giant Governor and Lacatan varieties of banana.



Source: <http://www.wbagrimarketingboard.gov.in/>

The primary survey conducted in the different districts of West Bengal with approximately 150 farmers in each district revealed the following statistics with respect to Variety grown , average yield , highest and lowest price across the districts.

⁷Report Credit Analysis & Research Limited [CARE], 2013

⁸NHB advance estimates 2012-13

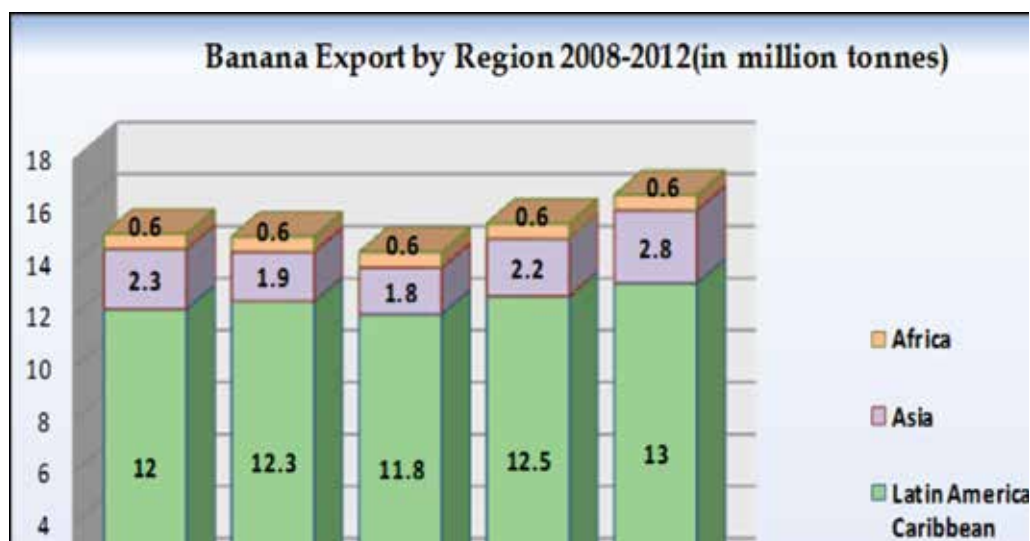
District	Variety	Sample Size	Average Yield	Average Highest Price (Per Kandhi)*	Average Lowest Price (Per Kandhi)*
Coochbehar	Mal Bhog	123	261	236	143
	Suger	24	231	235	171
Hooghly	Chapakala	89	372	221	134
	Singapoori	53	351	223	154
Jalpaiguri	Mal Bhog	148	352	248	195
Murshidabad	Singapoori	89	296	236	175
	Suger	59	302	231	186
Nadia	G9	22	345	228	142
	Singapoori	25	367	228	154
	Kachhakela	82	377	231	186
North 24 Pargana	Singapoori	120	360	216	125
	Kanthali	15	346	255	216
South 24 Pargana	Singapoori	82	377	232	167
	G9	33	343	239	162
	Kanthali	43	401	225	155

* One Kandhi is equal to 10-12 kgs

Source: Primary Survey of 150 farmers in each district

1.3. Developments in banana trade

In 2012 the volume of global banana exports reached a record high of 16.5 million tonnes, 1.1 million tonnes (or 7.3 percent) above 2011 level⁹. The increase is primarily explained by the growth of exports from Latin America and the Caribbean from 12.5 to 13.0 million tonnes, despite the poor performance of Ecuador.



Source: Banana Market Review and Banana Statistics 2012-2013, FAO

⁹Banana Market Review and Banana Statistics 2012-2013, Market and Policy Analyses of Raw Materials, Horticulture and Tropical (RAMHOT) Products Team, Food and Agriculture Organization of the United Nations, Rome, 2014

Exports from Asia showed a remarkable recovery: After substantial declines in exports between 2006 and 2010, which were driven by shrinking exports from the Philippines, the volume of exports from the region rose 25.6 percent in 2011 and 27.1 percent in 2012, reaching almost 2.82 million tonnes, well above the previous record of 2.4 million tonnes in 2006¹⁰.

With the remarkable growth rates in both 2011 and 2012, the Philippines reached the peak of its export performance in 2012 at 2.6 million tonnes, corresponding to 93.9 percent of all exports from Asia¹¹. Whereas the contribution of India remains at a meager 0.0054 million tonnes only, leaving a huge unexplored market for Indian Banana export.



Source: Banana Market Review and Banana Statistics 2012-2013, FAO

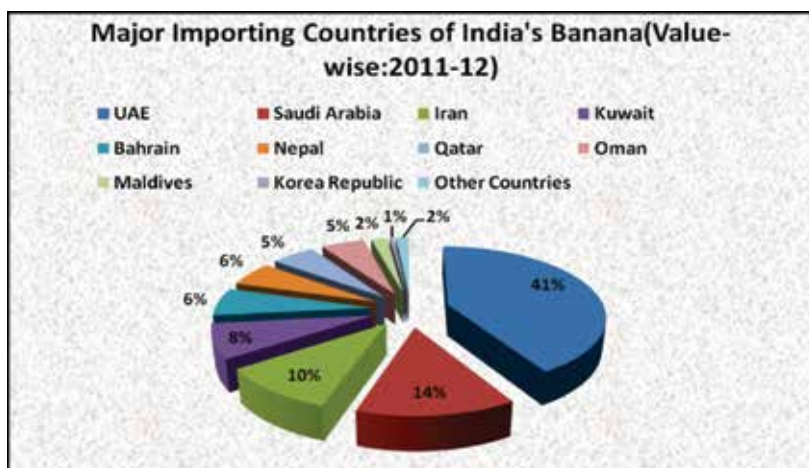
1.4. Market for Banana

With Developing countries on the other hand will continue to register an increase in demand for the fruit, with imports predicted to rise 2.5% to 2.33 million tonnes, driven largely by China. If the recession bottoms out by the end of 2009, then the demand for bananas will increase by up to 7.8% and tropical fruits by about 2% in 2010, FAO said.

The major destinations of India's banana were UAE, Saudi Arabia, Iran, Kuwait and Bahrain respectively.

¹⁰Banana Market Review and Banana Statistics 2012-2013, Market and Policy Analyses of Raw Materials, Horticulture and Tropical (RAMHOT) Products Team, Food and Agriculture Organization of the United Nations, Rome, 2014

¹¹Banana Market Review and Banana Statistics 2012-2013, Market and Policy Analyses of Raw Materials, Horticulture and Tropical (RAMHOT) Products Team, Food and Agriculture Organization of the United Nations, Rome, 2014



Source: <http://agriexchange.apeda.gov.in/Market%20Profile/one/BANANA.aspx> (DGCIA)

With steady growth in populations and income, and rising awareness about the positive nutritional value of the fruit, global banana and tropical fruit consumption is likely to continue its upward trend in the next few decades the FAO report said.

1.5. Value Addition in Banana

Presently, India is witnessing a transition in food consumption habits as the per capita income rises. Consumers are becoming increasingly aware of the nutritional benefits being offered by the food products they purchase and the demand for non-grain food crops, fruits and animal products (dairy and poultry) is expanding¹². Value added products like puree, jams, health drinks, milk shakes and juices all of which use fruits as a base can satisfy this change in the consumption preference

Banana is a readily available fruit and comes at a price sensitive to the lower income consumer's daily energy needs. Processing the banana fruit to harness its nutritive value, needs to remain keenly sensitive to the price concerns it will place domestically on this energy source. Banana has a shelf life of 6-7 days which makes it a highly perishable fruit crop. NRCB through a recent research estimated the losses at around 20-24% which amounts to 3 to 4 million tonnes (valued at Rs. 3000 crores per annum).

Being rich in iron, with required dietary fiber, potassium, vitamin's B6 and C, banana processed outputs will be in demand by urban consumers needing high sources of energy in ready to eat foods. Of the different levels of processing, the ones for powder and chips (identified in the report below) seek to conserve the nutritional value of banana and serve multiple consumer's nutritional needs (for bakery, energy, nutrition, confectionary items) and keep a look out for related income / spending sensitivities.

In terms of nutrition, Banana as fresh fruit comes at a relatively lower price, and often serves as the poor man's ready energy source. This fruit is rich in iron, with low saturated fat levels, low sodium content and it provides much needed dietary fiber, potassium, including vitamin B6, and vitamin C. We compare the nutritive value of inputs used to create chips and report the findings in the table below.

¹²IWMI, 2007: http://www.iwmi.cgiar.org/Publications/IWMI_Research_Reports/PDF/PUB119/RR119.pdf

Table 1. Nutritional Comparison of the crops used for Chips Processing

Nutrition Facts per 100g			
	Potato	Banana	Tapioca
Calories	77	88	159
Total Fat	0.1 g	0.3 g	0.3 g
Saturated fat	0.1 g	0.1 g	0.1 g
Poly unsaturated fat	0 g	0.1 g	0.1 g
Mono unsaturated fat	0 g	0.1 g	0.1 g
Cholesterol	0 mg	0 mg	0 mg
Sodium	6 mg	1mg	14 mg
Potassium	421 mg	358 mg	271 mg
Total Carbohydrate	17g	23 g	38 g
Dietary fiber	2.2g	2.6 g	1.8 g
Sugar	0.8g	12 g	1.7 g
Protein	2g	1.1 g	1.4 g
Vitamin A	0%	1%	0%
Calcium	1%	0%	1%
Vitamin D	0%	0%	0%
Vitamin B-12	0%	0%	0%
Vitamin C	32%	14%	34%
Iron	4%	1%	1%
Vitamin B-6	15%	20%	5%
Magnesium	5%	6%	5%
*Per cent Daily Values are based on a 2,000 calorie diet.			

Source: USDA

1.6. SWOT FOR BANANA PROCESSING IN WEST BENGAL (WB)

Strengths (Ready Raw Material Availability and related input costs for Processing)

The availability of water and good soil condition makes the state a top producer of many crops in India. Related production advantages (over the rest of India) in vegetables and fruits ensure processors have an abundant raw material base for processing. The growth of Agriculture sector in West Bengal for the year 2013 was 2.56% while the national growth recorded was 1.79%. ¹³Fruits are produced in bulk in West Bengal and they have a high rate of export from India. Due to the geographic location of state, it has been a major hub on the important trade route to the South East Asia and ASEAN countries. There is a potential to develop several points in state as hubs for cold storage, grading & sorting, processing for value additions and packaging for products been sent to North East, and neighboring countries of Nepal, Bhutan, Bangladesh and Myanmar¹⁴.

¹³Draft Investment and Industrial Policy of West Bengal, 2013 (Govt. of West Bengal)

¹⁴Draft Investment and Industrial Policy of West Bengal, 2013 (Govt. of West Bengal)

Local sourcing of raw material would not pose a problem for SMEs. Food Processing Industries Survey, West Bengal, 2009 confirms West Bengal's surplus in the vegetables and fruits that helps ensure enough raw materials are available in the state. This directly results in lower input costs for processing industries.

Weaknesses

The farmers are yet to develop a complete scientific outlook which causes laggardness. This can be imparted through increased training and farmer centric workshops. In addition to it, the overall market infrastructure, post-harvest management and value addition sector is in the developing phase with an immense scope of improvement¹⁵.

Opportunity (Additional Incomes from Processing)

Agriculture in West Bengal is small farmer centric with 90 per cent of the cultivators being small and marginal farmers. Small and marginal farming communities hold 84% of the state's agricultural lands. Marginal operational holding (less than 1 hectare) accounts for 88.8 percent of the total operational holdings as against 69.8 percent at all India level . This suggests a majority of farmers work on thin margins, high costs.

More recently, reports of limited availability of skilled labor have made farming a fairly expensive exercise. Profit margins of small farmers might welcome the fillip from returns earned from venturing into processing. As entrepreneurs, these same farmers have the highest probability of turning to processing to generate additional income. (AT Kearney, 2013)

India has an excellent scope for development of several value added products like juice, biscuit, banana powder. Also, only 2.5 % of the total produce is processed in the country indicating an immense potential for food processing industry to grow and flourish¹⁷.

Threats (Market Awareness)

Positioning of processed foods for SME's needs nuanced marketing approaches.

Food processing has been receiving increased attention in the country as a solution to micronutrient deficiency (AT Kearney, 2013). Yet a majority of states in India do not possess high awareness levels on food quality and/ nutrition. Processed food's targeting mass markets across India need to recognize this constraint.

SME's¹⁸ would benefit when they ensure their firm's short and / medium term focus stays zoomed in on financial viability (up to 3 years). Positioning nutrition as an SME's long term focus would prove beneficial. The returns for such nutrition focus would more likely come over the medium and/ longer term (up to 50 year time frame).

¹⁵NABARD WEST BENGAL, 2009

¹⁶AGRO-ECONOMIC RESEARCH CENTRE VISVA-BHARATI SANTINIKETAN 2012

¹⁷Rashmi SB, Jyothsna V (2011) Rural entrepreneurship: exploring the opportunities from waste products of bananas plant in Karnataka. International Journal of Research in Computer Application & Management 1: 105-107.

¹⁸Enterprises engaged in the manufacture or production, processing or preservation of goods as specified below: A small enterprise is an enterprise where the investment in plant and machinery is more than Rs. 25 lakh but does not exceed Rs. 5 crore; a medium enterprise is an enterprise where the investment in plant and machinery is more than Rs.5 crore but does not exceed Rs.10 crore.

Value addition at processing level in India is relatively low at present. Increased emphasis on processing can encourage technology, R&D investments in the field, which can further lead to economically viable technology solutions making it more accessible for SME's and farmers to take up processing. (Source: AT Kearney, 2013)

Section 2 - Banana Powder

SECTION 2 - BANANA POWDER

Banana is considered to be one of the most popular and widely consumed fruits in India due to the nutritional value it offers at a relatively lower price. The fruit is a rich source of carbohydrates and vitamin B; it is also easy to digest containing no fat or cholesterol. However, under normal conditions, banana has a shelf life of 6-7 days which makes it a highly perishable fruit crop. Moreover, the losses are estimated to be almost one-fourth of the total production and the key reasons for these losses have been cited as faulty handling procedures like improper transportation, lack of packaging, cold chain and post-harvest storage infrastructural facilities.

Value addition through processing can ensure adequate return to the farmers and avoid losses due to perishable nature of the produce. This can also enable export of food products to the markets world over and avoid glut in the local market²⁰. The objective of the this profile is to present a clear plan and ground reality to prospective entrepreneurs in MSME sector for entering into the banana processing industry in West Bengal. The profile will guide, encourage and assist entrepreneurs with an initial investment of around 34 lacs (plant and machinery) of the opportunities and challenges they are likely to face in the sector. The entrepreneur is expected to breakeven within the 2nd year of operation with the plant working for 240-280 days in a year with an operating capacity of 30% and 40% during 1st and 2nd year respectively

2.1. RAW MATERIAL AVAILABILITY

The varieties which are deemed suitable for the production of banana powder are the ones containing low sugar content. The most ideal variety to produce high quality banana powder is Nendran, which is largely grown in the southern India but not in West Bengal. Dwarf Cavendish (locally known as Singapori) which is available in West Bengal can replace Nendran as there is a marginal difference between their properties. Out of the indigenous varieties grown in West Bengal, Rasthali can also be directly used for processing into Powder. Other materials include oil, salt, packaging material, flavours, citric acid, label etc. that can be sourced locally.

Regional Banana Characteristics:

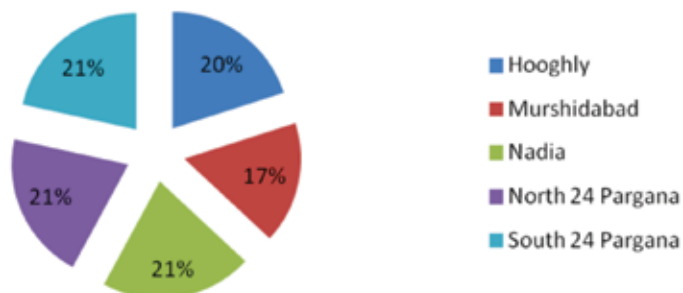
Nadia	<ul style="list-style-type: none"> •Area under Banana cultivation: 3.60 thousand HA •Varieties : Singapori, Giant Governor, Champa, Martaman, KanchakeBe •Average yield: 15-23 MT/H •Cost for raw material: Rs. 60 to Rs. 350/per loom (each loom= 10 to 25 kgs of Bananas)
South 24 Parganas	<ul style="list-style-type: none"> •Area under Banana cultivation: 2.12 thousand HA •Varieties : Singapori, Giant Governor, Champa, Martaman, Kathali •Average yield: 15-23 MT/H •Cost for raw material: Rs. 5-15/kg
Hooghly	<ul style="list-style-type: none"> •Area under Banana cultivation: 4.49 thousand HA •Production: 82.65 thousand tons
North 24 Parganas	<ul style="list-style-type: none"> •Area under Banana cultivation: 5.18 thousand HA •Production: 82.65 thousand tons
Murshidabad	<ul style="list-style-type: none"> •Area under Banana cultivation: 2.49 thousand HA •Production: 44.69thousand tons

Source: www.wbagrimarketingboard.gov.in/fruits/fruits3.htm

¹⁹<http://www.nrcb.res.in/document/vision%202050.pdf>

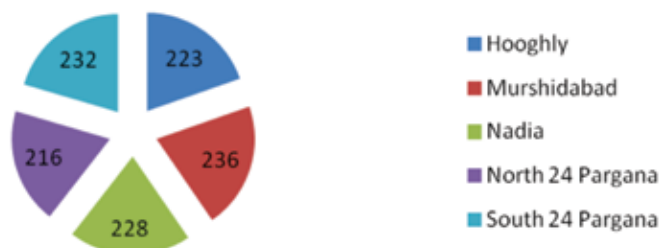
²⁰West Bengal Food Processing Industry Policy 2011

Average Yield of Singapoori Banana across districts in West Bengal



Source: Primary Survey of 150 farmers in each district

Average Highest Price of Singapoori Banana Across Districts in West Bengal



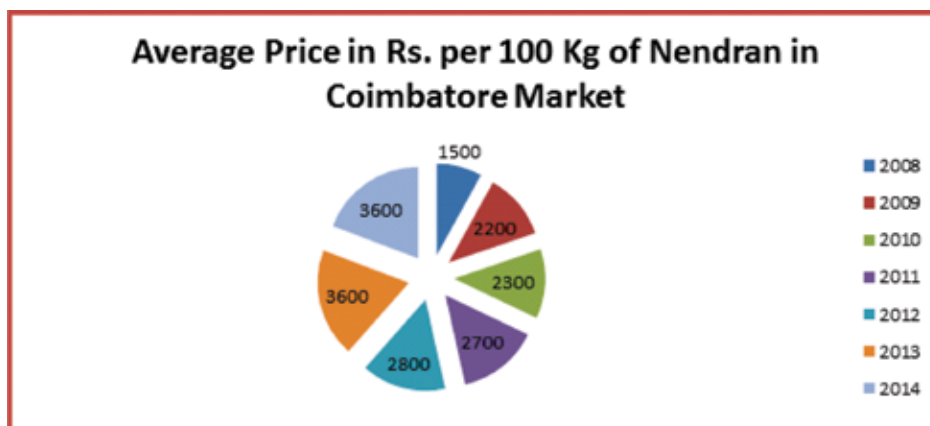
Source: Primary Survey of 150 farmers in each district

Average Lowest Price of Singapoori Banana Across Districts in West Bengal



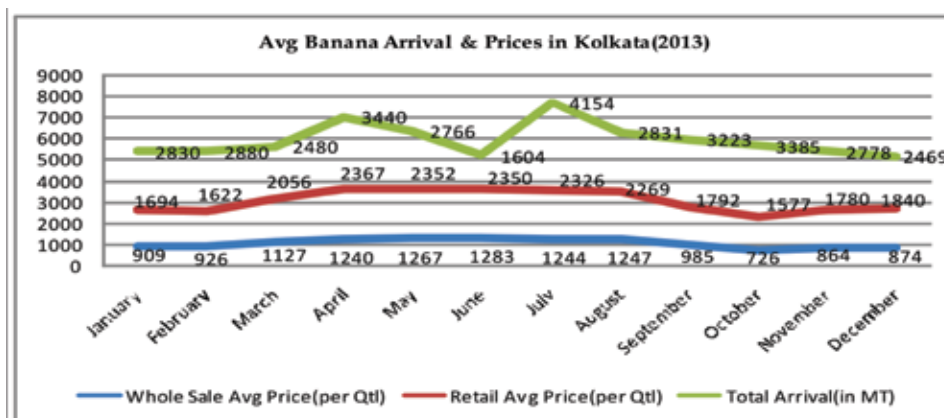
Source: Primary Survey of 150 farmers in each district

The Average Price in Rs. per 100 Kg of Nendran variety of Banana in Coimbatore Market is reflected below:



Source: Primary Survey in Coimbatore Market

The whole sale prices for bananas are in the range of INR 900 to 1500 per quintal in Kolkata (indicated below). A small or medium entrepreneur would require 100 kgs of bananas to produce 15-20 kgs of banana powder which can fetch INR 400-500/Kg in the Indian market.



For a pilot plant using 1000kg of bananas as raw material for producing banana powder the estimated cost would be around Rs. 821364. Assuming that there would be no cost incurred on land and building, the cost break up is as below.

S. No.	Item	Amount
1	Land and Building	0
2	Plant and Machinery	670000
3	Prel. & Preoperative Exps.	30000
4	Staff and Labour	23400
5	Misc. Assets	30000
6	Contingencies @ 10% on Building and plant and machinery	67000
7	Working Capital Margin	964
	Total	821364

For an entrepreneur to derive profitable returns on the processing plant, the location of the plant should be decided based on the proximity to:

1. The area growing the varieties suited for powder production
2. Area with access to roads, transportation facilities, banking infrastructure and electricity
3. Major cities or towns
4. Ports, railways and Airports

2.1.1. District-wise Financial Inclusion in West Bengal:

Mentioned below are top districts of west Bengal in terms of availability of Financial Infrastructure

Districts	Rank
Kolkata	1
Darjeeling	2
Birbhum	3
Bardhaman	4
Haora	5
Hugli	6
Bankura	7
North 24-Parganas	8
Koch Bihar	9
Midnapore	10

2.1.2. District-wise Road Length in West Bengal

Mentioned below are top districts of West Bengal in terms Road Infrastructure²¹:

(Unit : Km.)			
Districts	31.03.2006		
	Surfaced	Unsurfaced	Total
Midnapore	2038	51	2089
Burdwan	1940	2	1942
24-Parganas (North)	1342	2	1344
Jalpaiguri	1253	3	1256
Murshidabad	1213	11	1224
24-Parganas (South)	1212	3	1215

²¹Research study by Shri Sadhan Kumar Chattopadhyay , Assistant Adviser in DEPR, RBI, Mumbai, 2011

²²<http://nhb.gov.in/model-project-reports/Horticulture%20Crops%5Cbanana%5CBanana1.htm>

²³Primary survey conducted from:

1) Saipro Biotech Private Limited, Pune (<http://www.saiprobiotech.co.in/>)

2) G. G. Foods, Udaipur(<http://www.indiamart.com/ggfoods/>)

Bankura	1170	16	1186
Hooghly	1184	-	1184
Birbhum	1168	9	1177
Nadia	999	6	1005

Source: Indiastat

Source: NHB 2013

2.2. MARKET OPPORTUNITIES

Even though India accounts for only 16.55 per cent in area under banana cultivation, it leads in banana production with 29.19 per cent share of global banana production trailed by China and Philippines. However, India's contribution to the banana exports stands at less than 1% indicating that the major share of the banana production is consumed domestically as raw fruit. Considering the competition in the market combined with an estimated 25 - 40% of the banana crop produced being wasted and only 2% being utilized for processing into value added products, a farmer or a small entrepreneur engaged in banana production is likely to be exposed to price imbalance and large price variations²². In order to create an additional income source to offset such price imbalance, venturing into processing can be beneficial.

Banana Powder can also be used in the development of value added products such as biscuits which contain relatively less fat and more nutrients. Banana Powder is also a good source of Dietary Fiber, Potassium and has multiple medicinal properties which can be used as an additive in confectionary, nutritional supplements and in baby food as well. The use of banana powder in baby food during the weaning phase has already been a traditional practice India which can also provide Banana powder processing SME's an opportunity to either directly sell the product in the markets or by association with baby food manufacturing companies. According to several banana powder manufacturers and exporters, the maximum demand that is received is from the Industry involved in the manufacturing of bakery/confectionery products and baby food²³.

The following figure indicates the growth in the market size of baby food around the world:



Source: <http://www.ats-sea.agr.gc.ca/inter/5852-eng.htm> (Agriculture and Agri-Food Canada, Govt of Canada: Global Pathfinder Report, 2011)

²⁴http://marketpublishers.com/report/consumers_goods/food_beverage/confectionery_global_industry_guide.html

The global confectionery market grew at a 3.2% CAGR between 2007 and 2011 and generated USD 157,640 million in revenue by end-2011(2013 research by Market Line). The research shows that the confectionery market will exhibit similar growth pattern in the subsequent years with a 3% CAGR during 2011-2016 resulting in the generation of USD 182,697 million by 2016. The confectionery market in Europe is expected to reach more than 7,079 million kg by end-2016 from a volume of about 6,573 million kg in 2011. Similarly, Asia-Pacific confectionery market is expected to touch 2,927 million kg by 2016-end, an increase of 12.4% since 2011²⁴.

With diverse applications and benefits, banana powder can cater to various sections of society and demography's at the same time making it one of the products having highest potential in terms of market size and consumer base.

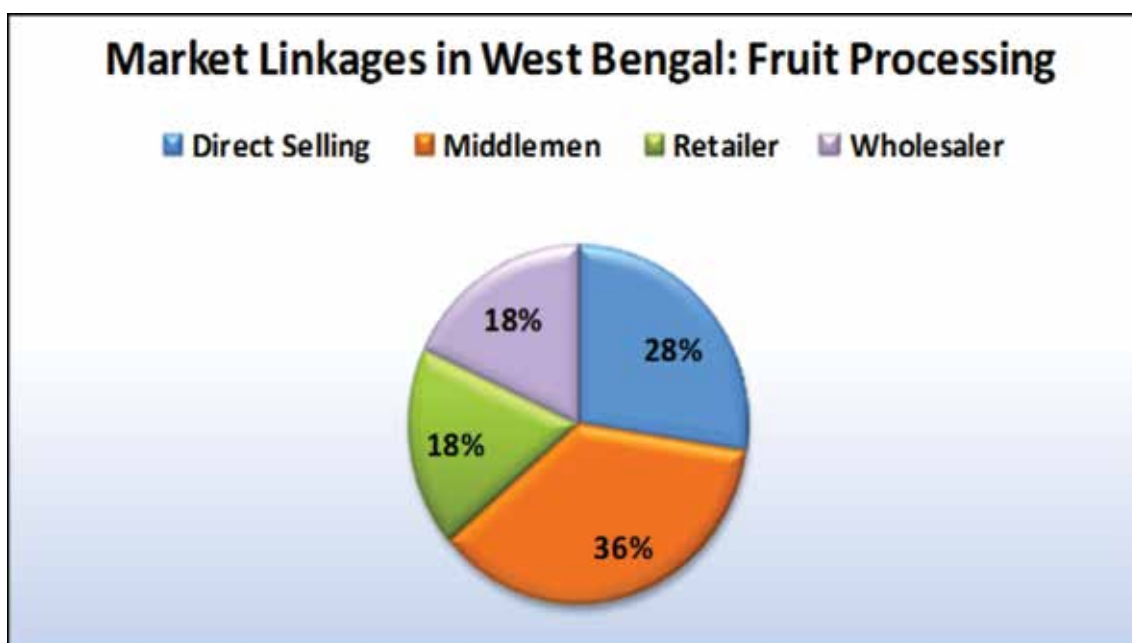
2.2.2. Marketing Strategy

This profile will enable a small scale entrepreneur to take a calculated decision to venture into banana processing, particularly banana powder manufacturing. In order to derive profitable returns, a well-planned strategy will have to be employed to market the product not only domestically but in the international markets as well.

Since banana powder is majorly used as an ingredient in multiple products, an entrepreneur would need to identify and approach organizations engaged in the manufacturing of such products. Another approach can be position yourself as a standalone banana powder manufacturing entity and establish your brand name in the market. This would require approaching retailers and distributors to get your product out in the market. Some of the other states with significant production of banana assist their banana processing SME's by providing market linkage through state agriculture. In addition to the assistance provided by the state, the SME's in these states also get the products to the market with the help of local transporters who collect the finished product and take them to the associated retailers in the adjoining cities. These transporters charge the processors a particular amount per kg for transportation. Simultaneously, an effort has to be made to explore international markets and interact with foreign players, traders and retailers to ensure that they are made aware of an alternate supplier for banana powder in India.

According to a research conducted for exploring the marketing channels available to a fruit processor in West Bengal, where Mango Fruit was taken as the research object, it was found that majority of the food/fruit processing units in West Bengal were selling their products through intermediaries like middlemen, retailers and wholesalers. This indicates potential for the development of dedicated marketing channels for fruit processors that could assist in getting the products readily available in the domestic and international market²⁵.

²⁵AGRO-ECONOMIC RESEARCH CENTRE ,VISVA-BHARATI ,SANTINIKETAN, 2010



Source: <http://www.visva-bharati.ac.in/InstitutionsCentresSchools/Contents/AERC-DETAIL/Final-Report-164.pdf>

The scope for the product is immense but it would need focused effort on the part of the entrepreneur to find buyers and traders who can get the banana powder from the plant available in the open market. With the advent of the e-commerce websites and their rising popularity, it would also be prudent to get the product listed on such sites in order to reach global buyers instantly.

2.3. PROJECT DESCRIPTION

The following section provides the financial analysis of manufacturing 72 tonnes of banana powder annually. It will present an indicative description of the capital investment, working capital and projected profits for an entrepreneur planning to set-up a processing unit using the manufacturing method as indicated by figure 2 above (which uses raw banana). These financials may vary according to an individual's financial budget, capacity planned and the region for setting up the plant.

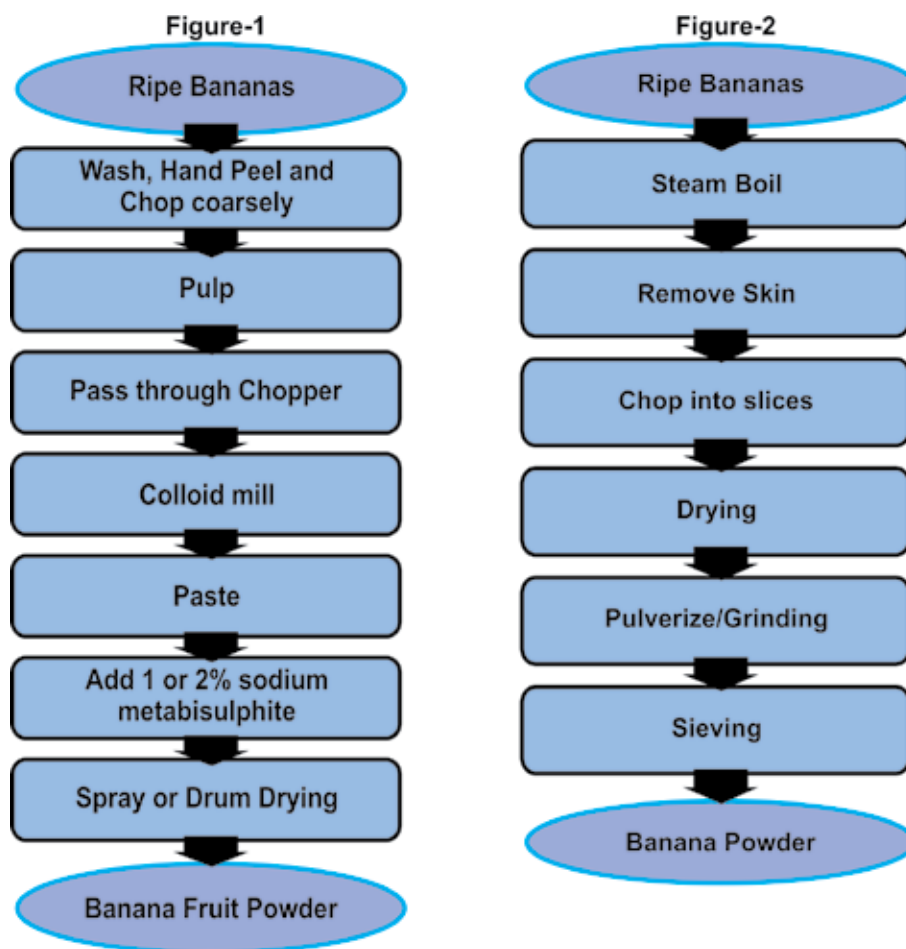
a) Product & Its uses

Banana is considered to be the most popular fruit in India and around the world, being a rich source of energy abundantly available at a low price. Similarly, the powdered form of Banana offers all the benefits contained in the raw fruit. It's rich in potassium which is essential in keeping the heart and nervous system healthy along with keeping the bones, kidneys in good shape. Banana powder also acts as a natural medicine as it is said to have an antacid affect along with being recommended for children recovering from gastrointestinal problems, particularly diarrhea. It is also known to have a very high percentage of Vitamin B6 that plays a significant role in production of antibodies responsible for the formation a strong immune system.

b) Capacity

The proposed capacity of the plant is to produce 72 MT / annum of banana powder.

c) Manufacturing process:



For an entrepreneur, there exist two methods for commercial production of powder. The first one is to make banana fruit powder (figure 1 above)²⁶, which is relatively costlier (Spray dried) and used for weaning food and production of milk shakes and sausages. The other method is using raw bananas, cooking it, peel the outer skin, chopping into pieces drying and grinding to make banana powder (figure 2 above).²⁷The mass production of the powder thus obtained from the second method can be achieved through mixing with corn and wheat flour and it is utilized for making plenty of food products like readymade chapatti's, s pharmacy products and bakery items.

Spray drying is used to take input as in the liquid form (juice) while drum drying takes input in semi-solid form (puree). The output yield obtained from spray drying varies from 8 to 11% of the fresh fruit, while drum drying produces an output a yield of about 13%. Banana Powder is considered to be stable for minimum 1 year post packaging. Good quality Banana powder depends on the variety and degree of ripeness of banana used along with the processing operation.

²⁶http://www.agritech.tnau.ac.in/expert_system/banana/index.html

²⁷Primary inputs received from: G. Ajeethan, General Secretary, Tamilnadu Banana Growers federation

2.4. PROJECT COMPONENTS & COST

2.5. ASSUMPTIONS

- The plant will work for 240 days in a year.
- The operating capacity is 30 % and 40% during 1st year and 2nd year respectively.
- Price of raw material and selling price of finished products is taken at Rs.10/ kg and Rs. 500/ kg respectively.
- Packaging cost: INR 20/Kg for Intra State transport (Prices in Tamil Nadu). It may cost more if an entrepreneur wants distribute the finished product to other states or countries.
- Transportation Cost: INR 3/Kg (Prices in Tamil Nadu)
- The land rates and cost of utilities are specific to Nadia region in West Bengal and may vary according to other regions.
- Cost of Electricity: Rs.9/ Unit
- Cost of Water: Rs.9/ per KL

a) Land & Building

Land with an area of 1800 Sq Feet and building with covered area of 1260 Sq Mtr. having the provision of production Hall, Raw Material stores, Finished Goods Store.

S. No.	Item	Qty. sq. ft.	Rate	Amount
1	Land	1800	103	1,85,400
2	Land Development	1800	350	6,30,000
3	Building & Civil Construction	1260	750	9,45,000
	Total			17,60,400

Assumption: The above mentioned land area is given for an entrepreneur who wants to start the plant which is partially automated. As and when entrepreneur expands his business the land requirement might increase

b) Plant & Machinery

Item	Qty.	Amount
Pulverizer	1	1,20,000
Tray Drier	1	5,50,000
Total		6,70,000

Assumption: The above mentioned machine requirement as per inputs received from an entrepreneur producing banana powder using these machines. The machine requirement may vary as per an individual's requirement and financial budget.

c) Utilities

Power requirement will be around 150HP/day and around 500 liters of water shall be required every day for washing, potable and sanitation purposes. Total cost of utilities is estimated at Rs.3,00,000 per annum.

d) Prel. & Pre-Operative Expenses ,

A provision of Rs. 30,000 is made towards pre-production expenses like registration, establishment and administrative expenses, travelling, interest on loan during implementation trial run expenses etc.

e) Staff and Labor

Particulars	No.	Salary (per Month) Rs.	Total Price (Rs.) per annum
Plant Supervisor	1	20,000	2,40,000
Operator	1	15,000	1,80,000
Semi-Skilled Labour for processing	3	4,200	1,51,200
Marketing Executive	1	10,000	1,20,000
Total		6,91,200	

Assumption: The staff and labor requirement may vary for an entrepreneur as per an individual's requirement and financial budget

e) Working Capital Assessment

Particulars	Period	Margin	Total	Bank 75%	Promoters 25%
Stock of Raw Material	1 day	25%	8,219	6,164	2,055
Packing Material	1 month	25%	3,288	2,466	822
Stock of Finished Goods	½ month	25%	1,99,375	1,49,531	49,844
Receivables	½ month	25%	13,50,000	1,012,500	3,37,500
Total			15,60,882	1,17,0661	3,90,220

f) Cost of the Project and Means of Financing

S. No.	Item	Amount	
1	Land and Building	17,60,400	
2	Plant and Machinery	6,70,000	

	Prel. & Preoperative Exps.	30,000	
	Misc. Assets	3,50,000	
	Contingencies @ 10% on Building and plant and machinery	2,43,040	
	Working Capital Margin	3,90,220	
	Total	34,43,660	
	Means of Finance		
	Promoters' Contribution	13,77,464	
	Term Loan from Bank	20,66,196	
	Total	34,43,660	
	Debt Equity Ratio	1.5	1.5:1
	Promoters' Contribution	40%	

2.6. PROJECTED PROFITABILITY

a) Production Capacity

The rated production capacity of the plant is 72 M Tons / year whereas actual capacity utilization is expected to be 30 % and 40 % during 1st year and 2nd year respectively

b) Sales Revenue at 100%

Product	Qty(in Kgs)	Selling Price(Rs/Kg)	Total Sales
Banana Powder	72,000	400	2,88,00,000
	Total		2,88,00,000

Selling Price Assumed at: INR 400/ kgs (basis primary survey conducted)

c) Raw Material Required at 100%

Product	Qty (in Kgs)	Rate (Rs / Kg)	Amount
Banana	3,60,000	10	36,00,000
Packing Material			14,40,000
Transportation			2,16,000
	Total		52,56,000

d) Projected Profitability

S. No.	Particulars	1st year	2nd year
A	Installed Capacity	72	
	Capacity Utilization	30%	40%
	Sales Realization	86,40,000	1,15,20,000
B	Cost of Production		

	Raw and Packing Material	15,76,800	21,02,400
	Utilities	3,00,000	3,30,000
	Salaries	6,91,200	6,91,200
	Stores and spares @ 15%	1,00,500	87,000
	Repair and maintenance @ 2.5%	2,16,000	2,88,000
	Selling and distribution expenses @25%	21,60,000	28,80,000
	Administrative expenses	1,50,000	1,87,000
	Total	51,94,500	65,65,600
C	Profit before Interest and Depreciation	34,45,500	49,54,400
	Interest on Term Loan	2,06,620	2,00,071
	Interest on working capital	1,40,479	1,50,000
	Depreciation	1,00,500	80,000
	Net Profit	29,97,901	45,24,329
	Income Tax @ 20%	5,99,580	9,04,866
	Profit after Tax	23,98,321	36,19,463
	Cash Accruals	24,98,821	36,99,463
	Loan Repayment	0	7,00,000

e) Break Even Point Analysis

S. No.	Particular	Amount	
	Sales		86,40,000
	Variable Cost		
	Raw and Packing Material	15,76,800	
	Utilities	2,10,000	
	Salaries	4,14,720	
	Stores and spares	1,00,500	
	Repair and maintenance @ 2.5%	2,16,000	
	Selling and distribution expenses @ 10%	15,12,000	
	Administrative expenses	75,000	
	Interest on working capital	1,40,479	42,45,499
	Surplus		43,94,501
	Fixed Cost		16,81,157
	Break Even Point(%)		38

f) Debt Service Coverage Ratio (DSCR)

Particular	1st Year	2nd Year
Cash Accruals	24,98,821	36,99,463
Add - Interest on TL	2,06,620	2,00,071
Total (A)	27,05,440	38,99,534
Payment of Interest on TL	2,06,620	2,00,071
Repayment of TL	0	7,00,000
Total (B)	2,06,620	9,00,071
DSCR (A)/(B)	13.09	4.33
Average DSCR	8.71	

g) Internal Rate of Return (IRR)

Year	Cash Accruals	25%
Cost of Project	-34,43,660	
1	24,98,821	19,99,057
2	36,99,463	23,71,451
3	75,00,000	38,46,154
4	75,00,000	30,73,770
5	75,00,000	24,59,016

2.7. SOURCES OF PROCESSING TECHNOLOGY

Indian Institute of Crop Processing Technology: IICPT, Ministry of Food Processing Industries, Government of India, Pudukkottai Road (NH 226), Thanjavur, Pillayarpathi layout, Thanjavur, Tamil Nadu 613005

2.8. PLANT AND MACHINERY SUPPLIERS

1. Arihant Engineering Works, 124, G N T Market, Dhar Road, Kagdipura Rd, Chhatribagh, Indore, Madhya Pradesh 452002
<http://arihantengineeringworks.tradeindia.com/>
 Mr. Ankit Verma (Proprietor)
 Mobile : +919425082586, +919425062437
 Phone : 91-731-2380535/2380537
2. Pratham Engineering, A - 04 / 05, Bharat Compound, Near Daras Dhaba, Western Express Highway, Kashimira, Mira Road East, National Highway 8, Kashimira, Mira Road East, Mira Bhayandar, Maharashtra 401104
www.prathamengineering.com
 Phone: 08447558703

2.9. BANANA POWDER MANUFACTURERS

Tamil Nadu

- 1) **White Bull Banana Powder**
Dhalavaipuram-626188, Virudhunagar dist. Tamilnadu
Phone: 094439 62191



Maharashtra

- 1) **Vinayak Ingredients (India) Private Limited**
Unit No.116, 1st Floor,
Cama Industrials Estate,
Sunmill Compound Lower Parel - west,
Mumbai - 400 013. INDIA.
Tel: +91 22 40560400
Mob: +91 9004600042
- 2) **Drytech India**
B - 45, Girikunj Industrial Estate,
OFF Mahakali Caves Road,
Andheri (East),
Mumbai - 400 093.
Tel: +91-22-26875361 / 62 / 63 / 64

Section 3 - Banana Chips

SECTION 3 - BANANA CHIPS

Being a highly perishable in nature, there is need to preserve this important fruit by value addition and manufacturing products like banana chips which has large export market. It can be preserved for 3 months or more by reducing moisture in it. This may be done by drying procedure or frying procedure. The keeping quality of the fruit is greatly improved by the reduction in the water content.

Value addition through processing can ensure adequate return to the farmers and avoid losses due to perishable nature of the produce. The objective of the this profile is to present a clear plan and ground reality to prospective entrepreneurs in MSME sector for entering into the banana processing industry in West Bengal. This section presents a clear picture on the economic and technical feasibility of setting up a banana chips manufacturing unit with an investment of around 25laks Rupees. The entrepreneur is expected to breakeven within theyear of operation. The financials are projected on the assumptions that the plant will work for 365 days in a year with an operating capacity of 60 %, 70% and 80% during 1st year, 2nd year and 3rd year respectively.

3.1. RAW MATERIAL AVAILABILITY

The varieties which are deemed suitable for the production of chips are Nendran, Dwarf Cavendish and Pachabale. Nendran is the most commonly used variety for production of chips in southern region. On the other hand dwarf Cavendish is available in excess in West Bengal and can replace Nendran as the properties differ marginally (see Table 2.). Also Dwarf Cavendish, commonly known as singapori in West Bengal would appeal to the palate of the domestic market. Other materials include oil, salt, packaging material, flavours, citric acid, label etc. that can be sourced locally.

Table2. Physical and mechanical properties of raw banana

No.	Properties	Banana varieties	
1		Dwarf Cavendish	Nendran
2	diameter (max) (mm)	23.34	37.08
3	length (max) (mm)	137.00	194.50
4	width (max) (mm)	66.50	50.00
5	average weight of single fruit (g)	97.84	201.43
6	average pulp/peel ratio	1.39	2.32
7	average specific gravity (dimensionless)	0.933	1.005
8	load required to cut (max) (N)	22.40	28.20
9	cutting load per unit width (N/mm)	0.754	0.821

Banana contains about 20% sugar and reasonable amount of vitamins A, B, and C. This is considered to be a food having rich source of energy. It is consumed in several varieties of preparation and forms. When it is raw, it is used as vegetable or cooking purposes. It is easily digestible, when it is ripe; the pulp gets soft, sweet and has a pleasant aroma.

3.2. MARKET OPPORTUNITIES

3.2.1 Demand and Supply

The global economic slowdown in recent years had a relatively milder effect on the snack foods market as the ‘eating in’ trend amplified the demand for snacks served as appetizers at home, while fortification of snack items and new products with exotic flavors played a bigger role in sustaining consumer interest (GIA: Global report on Snack Foods market 2012) The industry witnessed a record number of new product launches and brands in recent years as manufacturers sought to attract consumers with new flavors and products with enriched nutritional profiles.

Healthy snacks are likely to enhance a greater demand for low-calorie, healthy and fiber-rich snacks. The Indian snacks market in the year 2009-10 was estimated to be worth Rs. 150 billion with the organized segment accounting for half of the market share and growing at a rate of 15-20%. The share of unorganized sector on the other hand being roughly Rs. 75 billion with growth at a rate of 7-8%.

One of the major benefits of consuming banana chips is their fiber content. Banana chips also serve as a source of iron, an essential mineral that benefits the health. Iron helps form hemoglobin and myoglobin, two proteins that provide tissues with a fresh supply of oxygen. Banana chips -- like whole bananas -- boost the intake of potassium. There exists a strong demand for banana chips as most people enjoy eating snacks.

The main export markets for Indian bananas have mainly been Middle East countries viz. U.A.E., Saudi Arabia, Oman, Bahrain and Qatar. Globally Grand Naine and Cavendish varieties have the most demand. India’s contribution to the banana exports stands at a meager 1% indicating that the major share of the banana production is consumed domestically, which leaves a huge unexplored global market for Banana and processed Banana products.

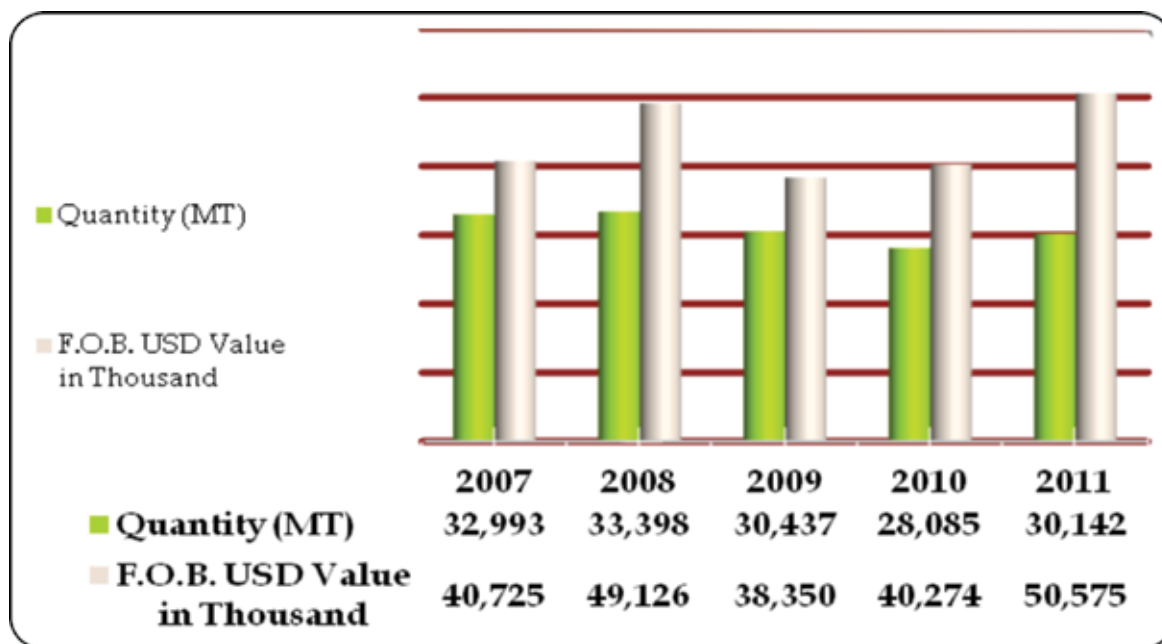
Figure: 1 Estimated Daily Consumption of Banana (Fresh) in Kolkata

State/Union Territory	Banana 2009-10 Production (in '000 Tones)	Banana 2010-11 Production (in '000 Tones)
West Bengal	982.2	1010.1
All India	26469.4	29780.2
Production per day (West Bengal)-MT	2691	2767
Production per day (All India)-MT	72519	81590
Approximate daily size of Kolkata Market (in MT)	604	680
No. of Bananas consumed daily in Kolkata	3625945	4079479

Globally Philippines is the major producer of Banana Chips and according to the Bureau of Agricultural Statistics (BAS) Report in 2006, major country destinations

of banana chip exports from Philippines have been the United States, Vietnam, Singapore, Taiwan, China, Japan, Hongkong, Germany, France, UK, Netherlands, and the Union of Soviet Socialist Republics. Philippines' exported volume in 2011 was 2,046,373.58 MT for fresh bananas worth \$470,957.85 million; for chips and crackers 30,141.62 MT valued at \$50,575.27 million²² indicating that a huge demand exists in these markets for Banana Chips, which could be a potential export market for India as well.

Figure: 2 Volumes and Value of Exports of Banana Chips from Philippines Year 2007-2011



Source: Philippines Bureau of Agricultural Statistics (www.bas.gov.ph)

3.2.2 Marketing Strategy

This study is focused on starting a small scale banana chip making business, selling the product in supermarkets, clubs, hotels or retail stores etc. Proper placement of products in the departmental stores, super markets, shopping mall etc. backed up by publicity with an USP of being a healthy snack is the key to success. It is also possible to have tie-up with exclusive restaurants, hotels, renowned caterers etc.

While fresh bananas are widely available, banana chips are not easily available in many parts of the country. Making chips increases the shelf life of the product in times of abundant harvest and provide an opportunity to increase the income levels, perhaps if the farmers are able to find a market rather than go for distress sale. If the entrepreneur wishes to sell direct to the end customer, then the location with the highest traffic should be chosen. This will generally mean higher expenses in the form of rent. If the entrepreneur wishes to sell through shops, hotels or clubs, then the business can be started from the production site however the entrepreneur will have to accept a lower mark-up to allow for a margin to be made for the shop owner.

3.3. PROJECT DESCRIPTION

3.3.1. Product & Its uses

In the banana processing sector, only 3-4% of the total production is processed. The banana processed products mainly consists of banana chips. Majority of the chips are produced from Nendran banana, however, Robusta and Monthan banana fruits are also being processed as chips to some extent in Maharashtra and Tamil Nadu states.

Banana chips are deep-fried and/or dried slices of bananas. They can be covered with sugar or honey or they can be flavoured with spices (tomato, Chilli, plain salted, Mexican, Italian etc.) or Variants of banana chips may be covered with chocolate, cream etc.

3.3.2. Capacity

The proposed capacity of the plant is to process 100 MT / annum of banana Chips.

3.3.3. Manufacturing process

Good large size bananas slices are cut cross wise to give circular shape. Bigger size fruits are preferred to produce large size slices and an attractive product. Different varieties give products of different colour, flavour and taste. Crosswise slicing gives uniform, circular, attractive, product and is universally adopted for commercial production.

Steps involved in Banana Chips processing

1. Selection: Good quality, green cooking bananas is preferred.
2. Cutting and Peeling: Using a knife, banana bunches are separated from the main stem and individual bananas hands are separated from the bunches (looms). Using a hand peeler, bananas are peeled and immediately sliced cross wise into thin, round slices.
3. Immersion in salt water: Immediately after slicing the slices are placed in salt water @ 3 to 5% of salt to the water. Added salt gets in to the slices and improves taste and acceptability of the product. If slices are not placed in water, they turn Brown and later give an unacceptable dark product.
4. Frying: Keep a large shallow Frying Pan or wok over a suitable stove (with adjustments for flame/heat control). Good edible vegetable cooking oil is used for frying. Bring the oil to fuming hot temperature. The long spoon or ladle used for taking out the fried chips from the wok can be either a big perforated one, of 8 to 12 inches in diameter and with long handle or of a large diameter wire mesh spoon with bamboo handle. The salt soaked slices are then dropped one by one manually into the hot oil in the frying pan. Never put the slices together in clusters into the oil as the slices being starchy stick to each other and are difficult to separate later.

Figure: 3 Steps involved in Banana Chips processing

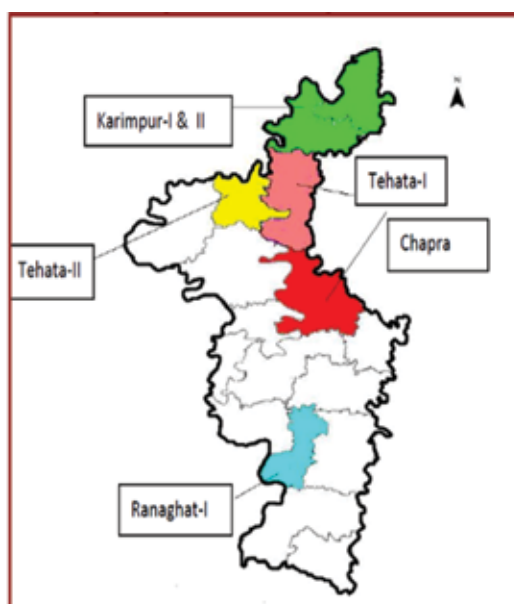


3.3.4. Facility location and layout

The Banana Chips manufacturing plant is proposed to be set up in Nadia District. The district is total 390027 sq. km. in area and holding 11th position in terms of area. It is surrounded by Murshidabad on the North & North-West, & North 24 on the South & South-west. The district shares international boundary with Bangladesh.

As Nadia has a good access to Bangladesh so it can enhance export and import activities to that country. The district is majorly known for Banana production in West Bengal.

Figure: 4 Top Five Banana Growing Blocks in Nadia



Source: District Statistical Handbook, 2009

Around 40.89% of population of Nadia District falls in the age group of 25-59 years implying a good source of Manpower. (Source: District Statistical Handbook, 2009)

Banking Infrastructure in Nadia:

Lead Bank - UBI Bank and following are the other banks found in the district

Name of the banks	Number of branches
State Bank of India	47
Allahabad Bank	23
Canara Bank	5
Central Bank of India	4
UCO bank	4
Bank of India	11
Gramin Bank	66

Transport Infrastructure in Nadia:

Nadia district is well connected through road ways, railways & waterways with other parts of the state:

- National High way: NH 34 and it runs from NSC Bose Airport to Dalkhola in north Bengal. At Dalkhola it meets NH-31 that goes to Siliguri.
 - Lane : 2 (proposed for conversion to 4 lane)
 - Length of roads within the district: 117 Km.
- Connected to other states: The NH is specific to West Bengal only.
 - Connected other districts : Murshidabad, Malda, Uttar Dinajpur, Dakshin Dinajpur, Kolkata
 - Blocks on the NH: The National high way-34 passes vertically throughout the district and touches different blocks such as Haringhata, Chakdaha, Ranaghat, Shantipur, Dhubulia, Nakashipara, kaliaganj etc.
- State Highway (SH) :
 - SH 3 connecting South 24 parganas, North 24 parganas and Kolkata.
 - SH 8 connecting Bankura and Burdwan.
 - SH 11 connecting Murshidabad.

Power Infrastructure in Nadia:

West Bengal State Electricity Transmission Company Ltd. (WBSETCL) is the only distributor of electricity in whole Nadia. Supply Stations (SS) are:

Sl. No	SS name	Capacity (KVA)
1	Debagram	132
2	Krishnanagar	220
3	Bagula	66
4	Ranaghat	132

3.4. PROJECT COMPONENTS & COST

For calculation in the following section the price of raw material and selling price of finished products is taken at Rs.11/ kg and Rs. 250/ kg respectively.

a) Land & Building

Land with an area of 170 Sq Mtr and building with covered area of 136 Sq Mtr. having the provision of production Hall, Raw Material stores, Finished Goods Store, Office and laboratory.

Item	Area (Sq Mtr)	Price per Sq Ft (Rs.)	Total Price (Rs.)
Land	170	103 sq ft	1,88,475
Land Development	170	350 sq ft	6,40,451
Building & Civil Construction	136	750 sq ft	10,97,918
Total	19,26,844		

b) Plant & Machinery

Item	Details	Qty	Price per unit (Rs.)	Price (Rs.)
Tray dryer	Volt: 230, watt 6kw; motor 3HP; model: Horizontal air flow; capacity 15kg; Temp range 200oC	1	100,000	100,000
Deep fat fryer	Temp range 300oC6lit; single phase; 2kW	1	15,000	15,000
Mechanical Slicer	11 blades; 0.5hp	1	50,000	50,000
Peeling and slicing knives	Knives set	10	5,000	50,000

Sealing machine-pedal operated	Impulse sealing-for sealing of LDPE/HDPE / Nylon / Laminates-pedal operated-	2	5,000	10,000
Steam jacketed blancher	Capacity:20kg	1	22,000	22,000
Total				2,02,000

c) Utilities

Power requirement will be 38350KWH (9 Rs per Unit) and around 182.5 Kiloltrs. (9rs per KL) of water shall be required every year day for washing, potable and sanitation purposes. Total cost of utilities is estimated at Rs. 3, 45,000 lacs.

d) Prel. & Pre Operative Expenses

A provision of Rs. 30,000 is made towards pre-production expenses like registration, establishment and administrative expenses, travelling, interest on loan during implementation trial run expenses etc.

e) Staff and Labour

Particulars	No.	Salary (per Month) Rs.	Total Price (Rs.) per annum
Plant Supervisor	1	20,000	2,40,000
Operator	1	15,000	1,80,000
Semi Skilled Labour for processing	3	4200 per person	1,51,200
Semi Skilled Labour for packaging	2	4200 per person	1,00,800
Marketing Executive	1	10,000	1,20,000
Total			7,92,000

f) Working Capital Assessment

Particulars	Period	Margin	Total	Bank	Promoters
Stock of Raw Material	1day	25%	21,370	16,027	5,343
P a c k i n g Material	7 days	25%	44,109	11,028	33,082
Stock of Finished Goods	3 days	25%	84,773	63,580	21,193
Receivables	7 days	25%	4,79,452	3,59,589	1,19,863
Total			6,29,704	4,72,278	1,57,426

g) Cost of the Project and Means of Financing

S. No.	Item	Amount	
1	Land and Building	19,27,369	
2	Plant and Machinery	2,02,000	
3	Prel. & Preoperative Exps.	30,000	
4	Misc. Assets	30,000	
5	Contingencies @ 10% on Building and plant and machinery	2,12,937	
6	Working Capital Margin	1,57,426	
A	Total	25,59,732	
	Means of Finance		
1	Promoters' Contribution	6,39,933	
2	Term Loan from Bank	19,19,799	
B	Total	25,59,732	
	Debt Equity Ratio	3	3:1
	Promoters' Contribution	25%	

3.5. PROJECTED PROFITABILITY

a) Production Capacity

The rated production capacity of the plant is 100 M Tons / year whereas actual capacity utilization is expected to be 60 % and 70 % during 1st year and 2nd year respectively.

b) Sales Revenue at 100%

Product	Qty (Metric Tons)	Selling Price (Rs. /Kg)	Total sales (Rs.)
Banana Chips	100	250 Rs. Per kg	2,50,00,000

c) Raw Material Required at 100%

Product	Qty (Metric Tons)	Price (Rs. / ton)	Total (Rs.)
Banana	600 (600000)	10 per kg	60,00,000
Edible oil	3.5 (35000)	50 per kg	17,50,000
Spices/Flavours, Salt etc.	----	-----	50,000
Packing Materials	-----	-----	23,00,000
		Total	1,01,00,000

d) Projected Profitability

S. No.	Particulars	1st year	2nd year
A	Installed Capacity	100	
	Capacity Utilization	60%	70%
	Sales Realization	1,50,00,000	17500,000
B	Cost of Production		
	Raw and Packing Material	60,60,000	70,70,000
	Utilities	2,07,000	2,41,500
	Salaries	7,92,000	7,92,000
	Stores and spares	4,50,000	5,25,000
	Repair and maintenance @ 2.5%	3,75,000	4,37,500
	Selling and distribution expenses @ 25%	37,50,000	43,75,000
	Administrative expenses	3,00,000	3,50,000
	Total	1,19,34,000	137,91,000
C	Profit before Interest and Depreciation	30,66,000	37,09,000
	Interest on Term Loan	1,91,980	1,21,189
	Interest on working capital	56,673	68,000
	Depreciation	30,300	25,755
	Net Profit	27,87,047	34,94,056
	Income Tax @ 20%	5,57,409	6,98,811
	Profit after Tax	22,29,637	27,95,245
	Cash Accruals	22,59,937	28,21,000
	Loan Repayment	0	7,00,000

e) Break Even Point Analysis

S. No.	Particular	Amount	
	Sales		1,50,00,000
	Variable Cost		
	Raw and Packing Material	60,60,000	
	Utilities	1,44,900	
	Salaries	4,75,200	
	Stores and spares	4,50,000	
	Repair and maintenance @ 2.5%	3,75,000	
	Selling and distribution expenses	26,25,000	
	Administrative expenses	1,50,000	
	Interest on working capital	56,673	1,03,36,773
	Surplus		46,63,227
	Fixed Cost		18,75,389
	Break Even Point		40

f) Debt Service Coverage Ratio (DSCR)

Particular	1st Year	2nd Year
Cash Accruals	22,59,937	28,21,000
Add - Interest on TL	1,91,979.9	1,21,188.9
Total (A)	24,51,917	29,42,189
Payment of Interest on TL	1,91,979.9	1,21,188.9
Repayment of TL	0	7,00,000
Total (B)	1,91,979.9	8,21,188.9
DSCR (A)/(B)	12.77	3.58
Average DSCR	8.18	

g) Internal Rate of Return (IRR)

Year	Cash Accruals	IRR
Cost of Project	-25,59,732	
1	22,59,937	-12%
2	28,21,000	58%
3	45,00,000	93%
4	45,00,000	105%
5	45,00,000	109%
		109%

3.6. SOURCES OF PROCESSING TECHNOLOGY

Central Food Technological Research Institute (CFTRI), Mysore (A constituent laboratory of Council of Scientific and Industrial research, New Delhi).

3.7. PLANT AND MACHINERY SUPPLIERS

- ECONOMODE, 118 / 105, Mumbai, Maharashtra Pin-400 066. Tel: (022) 28091223/ 28091274/ 32593325. Options: Manufacturer and supplier of snack food frying equipments like circular fryer, continuous fryer, rectangular fryer, mini rectangular fryer and ecoflam burner for banana wafer and more.
- Labh Group of Companies (Snacks Plant Division) India. Contact: M. Sen. Tel: 91-79-30070400. Options: Fresh Banana chips making machines manufacturer
- Sunil Commercial Corporation, Near Gole Building, Jodhpur. Rajasthan 342 003. Tel: (0291) 2433252. Options: Manufacturing food processing machines like circular fryers for products like banana wafers, pellets etc.
- Maruti Machines Private Limited, Plot No: 95, Road No: 8, Kathwada GIDC, Ahmedabad, Gujarat, India. Website: <http://www.marutimachines.com>, <http://www.marutimacpack.com>. Tel: 91-079-29701864 Options: PACKING CHIPS

- e) Hari Om Industries, Dhebar Road (South), Atika Ind. Area, Str.No.3, Nr. Jaydev Foundry, RAJKOT - 360 002. Options: Banana Wafer Machines, Other Food Processing Machines
- f) Gopal Desai (Partner) for banana chips / wafer plant (300 Kg. per day). <http://tinytechplants.tradeindia.com/company-information.html> Ref: Supplier and Manufacturer of technologies and tiny plants
- g) M/S Sanjivan Industries Private Limited (TM) Capacity 125 k. G. per hour. <http://sanjivan.tradeindia.com/contact-us.html> Options: Manufacturer of Banana Chips Making Machine.
- h) Heat and Control E2, 3rd Avenue, Anna Nagar East , Chennai 600 102, India tel:+91 44 4210-3950/51 or +91 44 2621 2943/44, fax: +91 44 4210-3949

3.8. BANANA CHIPS MANUFACTURERS:

Tamil Nadu:

1. **A-1 Chips and Exports India Pvt Ltd.**
R.D.M.Chinna, Thottam,
Kalayampalayam (P.O) pachapalayam,
Coimbatore-641010

Tamil Nadu INDIA

Phone: +914222477461
E.Mail:feedback@a1chips.in
Web: www.a1chips.in

2. **Banana Slice (India) pvt.Ltd.**
44, Kalingarayar street,Ramnagar
Coimbatore-641 009,

Tamil Nadu

Phone: +914222231067
banaanasice@msn.com

3. **Tasty Chips and Amaiya Ice-creams**
12, Nacharkoil Street,
Woraiyur, Trichirappalli,

Tamil Nadu

Phone: 09443422005
E.Mail:ammaiah1109@gmail.com

Kerala:

1. **Tierra Food India Pvt. Ltd.,**
Kinfra Food Processing Park,
Elamanoor, Kerala 691 524.
Phone: + 91 8943347333

**Administrative and legal
formalities For commencement
of New Business**

ADMINISTRATIVE AND LEGAL FORMALITIES FOR COMMENCEMENT OF NEW BUSINESS

1. Licensing and Registration of Food Businesses

- In exercise of the powers conferred under section 92 of the Food Safety and Standards Act, 2006, FSSAI makes it mandatory for all Food Business Operators in the country to be registered or licensed in accordance with the procedures laid down in the regulation.
- No person shall commence or carry on any food business except under a license.
- Any person desirous to commence or carry on any food business shall make an application for grant of a license to the Designated Officer, along with particulars and fees as may be specified by regulations.
- No license fee will have to be paid for the remaining period of the validity of the earlier license or registration granted under any of the said Acts or Orders.
- A single license may be issued by the Designated Officer for one or more articles of food and also for different establishments or premises in the same area.
- If the articles of food are manufactured, stored, sold or exhibited for sale at different premises situated in more than one area, separate applications shall be made and separate license shall be issued in respect of such premises not falling within the same area.
- An appeal against the order of rejection for the grant of license shall lie to the Commissioner of Food Safety.
- A license unless suspended or cancelled earlier shall be in force for such period as may be specified by regulations, at the time of grant of license.
- Non-compliance with the provisions laid under the regulation by a Food Business Operator will attract penalty
- The Licensing Authority, if it has reason to believe that the FBO has failed to comply with all or any of the conditions of the existing registration or license or the safety requirements given in Schedule 4, may give appropriate direction to FBO
- License for commencing or carrying on food business, Central Licensing Authority, provided that Food Authority may through notification make such changes or modify the list given in the Schedule I as considered necessary.
- License for commencing or carrying on food business, which are not covered under Schedule 1, shall be granted by the concerned State/UT's Licensing Authority.

- The Food Business Operator shall ensure that all conditions of license and safety, sanitary and hygienic requirements contained under different Parts depending on nature of business are complied with at all times .
- Provided that the Licensing Authority shall ensure periodical food safety audit and inspection of the licensed establishments through its own or agencies authorized for this purpose by the FSSAI.
- Provided further that no person shall manufacture, import, sell, stock, exhibit for distribution or sale any article of food which has been subjected to the treatment of irradiation, except under a license obtained from Department of Atomic Energy under the Atomic Energy (Control of Irradiation of Food) Regulations, 1996.

2. Administrative procedure

Steps to Set Up an Industry (Directorate of Micro & Small Scale Enterprises, Government of West Bengal)

- Execution of partnership deed / Articles & Memorandum of Association and obtaining Certificate from the Register of Companies / Registration with the Register of Co-Operatives in case of Co-operative Societies.
- Apply to Corporation / Municipality / Panchayat for locational clearance and get certificate of enlistment / license.
- Apply in prescribed format to the West Bengal Pollution Control Board, Paribesh Bhaban, 10A, Block-LA, Sector-III, Salt Lake City, Kolkata - 700 091 for No-Objection Certificate (NOC). For some specified group of items, NOC's are provided from District Industries Centre. (Contact District Industries Centre for details beforehand).
- Apply to District Industries Centre in prescribed format (available with District Industries Centre) for Provisional / Temporary Registration.
- Arrangement of land (outright purchase or rented). In case of lease-hold land for factory, at least 21 years terms may be preferred.
- Obtain quotation of machinery and raw materials from Authorized Dealers / Manufacturers.
- Preparation of scheme / project report for the proposed item / items of production / process / service. (Investment Employment ratio should be Rs. 50,000/- : 01, to come under AEP Scheme of the Government).
- Apply to CESC or WBSEB in prescribed format available at DE / SE / SS office, along-with Trade License, Rent receipt, SSI (Provisional/ Temporary) Registration Certificate, scheme etc., for electric power line in consultation with WBSEB

/ CESC. (Contact District Industries Centre with documentary evidences for recommendation for priority, if required).

- Submission of scheme / project report supported with current price quotation of machinery and raw materials, trade license and other related papers to DIC / Directorate of C & SSI, West Bengal, N. S. Building, 9th Floor 1, K. S. Roy Road, Kolkata - 700 001 / SISI, Government of India, 111 & 112, B. T. Road, Kolkata - 700 108 for vetting.
- Loan application to Financial Corporation / Commercial Bank through DIC, or directly as desired.
- Apply to District Industries Centre for loan under Margin Money Scheme in scheduled format along with copy of Provisional / Temporary SSI Registration, copy of vetted scheme, bio-data, and copy of sanction advice of WBFC / Bank etc. in duplicate / triplicate as the case may be. Immediately contact District Industries Centre after sanction of Bank / WBFC.
- Apply to the Commissioner, Commercial Taxes, 14, Beliaghata Road, Kolkata - 700 015 in scheduled format (available with S.T. Office) endorsing a copy to the concerned CTO, Commercial Taxes for necessary registration.
- Placement of order for supply of Machinery to the authorized dealers or manufacturers, after sanction or project in consultation with BANK / WBFC and DIC.
- Construction of factory shed and building (in case of own or lease hold) with prior approval of plan from appropriate authority of the area.
- Installation of Plant & Machinery and Electric Power Line.
- Recruitment of Staff & Workers.
- On commencement of production, apply to West Bengal Pollution Control Board, Kolkata for getting Pollution Clearance (Consent to Operate [COO]) from them. For some specified group of product apply to DIC. (Contact District Industries Centre for details beforehand).
- Apply to District Industries Centre for PMT / FNL SSI Registration in prescribed format (available with DIC to be procured on production of valid Trade License/ Certificate of Enlistment). Application for PMT / FNL SSI Registration is required to be submitted to DIC with all requisite documents positively within 6 [six] months from date of commencement of production to avail benefits of State Incentive Scheme.
- Apply to National Small Industries Corporation Limited, 20 Abdul Hamid Street, Kolkata 700 069 in prescribed format for single point registration for marketing assistance.

- In case of installation of captive power generating set, permission to be obtained from the District Administration and NOC to be obtained from CESC or WBSEB and WBPCB. The D. G. set to be finally registered with the office of the Chief Electrical Inspector, 1, Harish Mukherjee Road, Kolkata - 700 020.
- Regular linkage with all the concerned agencies like Bank / Financial Institution/ DIC/ SISI to provide feedback of information to them for guidance, if necessary.
- In case of Expansion / Modernization of the existing unit, prior approval of the expansion scheme / project from DIC/ Directorate of C & SSI, West Bengal / SISI Kolkata and due recording of the same in PMT / FNL SSI Registration Certificate are required to be obtained.

3. Tax Incentives provided by Ministry of MSME

CAPITAL INVESTMENT SUBSIDY

- For new Micro & Small Enterprise in Zone C & D

- Micro enterprise in Zone C - 25%
- Micro enterprise Zone D - 40%
- Small enterprise in Zone C - 15%
- Small enterprise in Zone D - 30%

a) Subject to a ceiling of Rs 50 Lakh for Small Enterprise.

b) 20% additional subsidy on admissible subsidy for all enterprises wholly owned by women, SC/ST and minority community entrepreneurs.

c) These entrepreneurs will also get incentive for setting up of units in Zone A & B as follows :

- Micro Unit - 15%
- Small Unit - 10%

d) This incentive would be in addition to what the units get from Gol under any other scheme.

INTEREST SUBSIDY ON TERM LOAN

Micro & Small Enterprise

- Subvention of 6% for all units and 7.5 % for units set up in the C and D Zone districts for 5 years.

Medium Enterprise

- Zone B & C - 25% of total Term Loan Interest subject to ceiling of Rs. 175.00 Lakh per year for 5 years.
- Zone D - 25% of total Term Loan Interest subject to ceiling of Rs. 175.00 Lakh per year for 7 years.

ELECTRICITY DUTY**Micro & Small Enterprise**

- 50% waiver for 5 yrs for Zones A & B & 75% for Zones C & D.
- The units set up in any zone and wholly owned by women, SC/ST and minority community entrepreneurs will be eligible for 100% waiver for 5 years.

Medium Enterprise

- Zone B & C - 100% waiver of electricity on the electricity consumption for 5 years subject to maximum of Rs. 25.00 Lakh per year or Rs. 1.25 Crore for 5 years.
- Zone D - 100% waiver of electricity duty on the electricity consumption for 5 years and 75% waiver from the sixth year upto tenth year subject to maximum of Rs. 50.00 Lakh per year or Rs. 2.5 Crore in 5 years.

POWER SUBSIDY**Micro & Small Enterprise**

- Subsidy of Rs. 1.00 / Kwh for Zone A & B
- Subsidy of Rs. 1.50 / Kwh for units in Zone C & D

For 5 years; subject to a ceiling of Rs 20 Lakh per annum for small enterprises and Rs 30 Lakh for medium enterprises. West Bengal MSME Policy 2013-18

INCENTIVE FOR ENERGY EFFICIENCY**Micro & Small Enterprise**

- 50% re-imbursement of the cost of energy audit undertaken by an certified agency to be available after implementation of the recommendations.
- 25% reimbursement of the cost of installations for energy conservation as per energy audit subject to a ceiling of Rs 2 Lakh.

STAMP DUTY & REGISTRATION FEE**Micro & Small Enterprise**

- 100% for units in Zone D, 75% for Zone C, 50% for Zone B and 25% for Zone A.

Medium Enterprise

- B, C & D Zone refund @ 75% of Stamp Duty.

ENTRY TAX

- Reimbursement of ET on plant and machinery available after beginning of commercial production by the unit.
- Reimbursement of ET on procurement of raw materials for the initial 3 years.

VAT**Micro, Small & Medium Enterprises**

- Zone B & C - 80% VAT refund paid for 8 years or 75% of fixed Capital Investment whichever reached earlier
- Zone D - 90% VAT refund paid for 8 years or 75% of fixed Capital Investment whichever reached earlier.

CST

Total refund for 3 years from the date of commencement of commercial production.

WATER CONSERVATION / ENVIRONMENT COMPLIANCE**Micro & Small Enterprise**

- Assistance upto 50% or Rs 2 Lakh maximum for water conservation/ pollution control measures.

CLUSTER DEVELOPMENT

- Support upto Rs. 5 crore for common infrastructure such as road, power etc for each micro and small industrial cluster in Zone B and C.
- Support upto Rs. 10 crore for common infrastructure such as road, power etc for each micro and small industrial cluster in Zone D.

SKILLED HR

- Undertake measures in collaboration with the industry to provide 10 million skilled HR over a period of 5 years.

STANDARD QUALITY COMPLIANCE

Micro & Small Enterprise West Bengal MSME Policy 2013-18

- 50% of cost upto a maximum of Rs. 5 lakh for obtaining certification / accreditation like ISO-9000, ISO-14000, ISO-18000, Social Accountability Standards, OEKO-TEX etc.

WORK FORCE WELFARE ASSISTANCE

- Reimbursement of 100% in 1st year & 75% in next remaining years expenditure incurred towards Employees State Insurance (ESI) and Employees Provident Fund (EPF) as follows: Zone B-5 yrs., Zone C-7 yrs., Zone D-9 yrs.

GI / PATENT REGISTRATION

- State Government will provide consultancy and facilitation services for identification and registration of Geographical Indicators (GI) of items.
- Reimbursement of 50% of expenditure for obtaining patent registration subject to a maximum of Rs. 5 lakh.

GRADED SLABS OF INCENTIVES

The districts of the state have been divided into 4 Zones for differential treatment under this Policy. Considering the needs of inclusive growth, the policy provides additional incentives for investment in backward regions of the state.

Zone -A: Kolkata Municipal Corporation area, all Municipal areas of North 24 Parganas, all municipal areas of South 24 Parganas, all municipal areas of Howrah.

Zone - B: District of Hooghly, North 24 Parganas (excluding municipal areas and Sunderban areas, South 24 Parganas (excluding municipal areas and Sunderban areas), Howrah (excluding municipal areas), Siliguri Municipal Corporation, Municipal corporation/municipal areas of Paschim Medinipur, Purba Medinipur, Burdwan & Nadia.

Zone -C: District of Burdwan (excluding Municipal Corporation/municipal areas), Purba Medinipur (excluding Municipal corporation/municipal areas), Nadia (excluding Municipal Corporation/municipal areas), Murshidabad, Malda, Jalpaiguri and Darjeeling (excluding Siliguri Municipal Corporation)

Zone -D: District of Birbhum, Purulia, Bankura, Paschim Medinipur (excluding Municipal corporation/municipal areas), Uttar Dinajpur, Dakshin Dinajpur, Cooch Behar and Sunderban areas of South and North 24 Parganas districts.

Conditions/eligibility of the units for availing incentives /financial assistance under this policy

- Modern /Hi-tech plant & Machinery to be installed that conform to the standard productivity.
- Unit will have to strictly observe requisite pollution control compliances.
- Regular Energy Audit is to be conducted and standard energy efficiency to be ensured wherever applicable.
- Unit will have to follow/maintain labour laws.
- Unit will have to commit to remain in production for at least 5 years from the date of commercial production. West Bengal MSME Policy 2013-18
- A unit defaulting in payment of any government dues / FI dues will not be eligible for assistance under this policy

Annexure A: List of sources

ANNEXURE A: LIST OF SOURCES

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23. <http://www.nrcb.res.in/document/vision%202050.pdf>
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25. http://nhm.nic.in/actionplan/actionplan_wb.pdf
26. <http://www.indiastat.com/default.aspx>
27. <http://www.indicat.com/Market-Rates/Commodity-Rates/Banana>
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29. <http://www.healthysupplies.co.uk-UK>
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32. <http://www.foodmanufacture.co.uk/Manufacturing/Fourayes-invests-1.3M-as-demand-for-jam-spreads>
33. http://www.iwmi.cgiar.org/Publications/IWMI_Research_Reports/PDF/PUB119/RR119.pdf
34. http://www.nutraceuticalsworld.com/issues/2012-11/view_features/international-markets-report-most-regions-paddle-along-sound-streams-of-growth/
http://www.nutraceuticalsworld.com/issues/2012-11/view_features/international-markets-report-most-regions-paddle-along-sound-streams-of-growth/
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Confederation of Indian Industry

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering industry, Government, and civil society, through advisory and consultative processes.

CII is a non-government, not-for-profit, industry-led and industry-managed organization, playing a proactive role in India's development process. Founded in 1895, India's premier business association has over 7400 members, from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 100,000 enterprises from around 250 national and regional sectoral industry bodies.

CII charts change by working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness and business opportunities for industry through a range of specialized services and strategic global linkages. It also provides a platform for consensus-building and networking on key issues.

Extending its agenda beyond business, CII assists industry to identify and execute corporate citizenship programmes. Partnerships with civil society organizations carry forward corporate initiatives for integrated and inclusive development across diverse domains including affirmative action, healthcare, education, livelihood, diversity management, skill development, empowerment of women, and water, to name a few.

The CII theme of 'Accelerating Growth, Creating Employment' for 2014-15 aims to strengthen a growth process that meets the aspirations of today's India. During the year, CII will specially focus on economic growth, education, skill development, manufacturing, investments, ease of doing business, export competitiveness, legal and regulatory architecture, labour law reforms and entrepreneurship as growth enablers.

With 64 offices, including 9 Centres of Excellence, in India, and 7 overseas offices in Australia, China, Egypt, France, Singapore, UK, and USA, as well as institutional partnerships with 300 counterpart organizations in 106 countries, CII serves as a reference point for Indian industry and the international business community.

Confederation of Indian Industry

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