MODEL DETAILED PROJECT REPORT

POTATO CHIPS

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

Project at a Glance

1.	Name of the Unit	:	
2.	Constitution	:	
3.	Date of Incorporation	:	
4.	CIN	:	
5.	PAN	:	
6.	GST		
7.	Registered Office	:	
8.	Factory Address	:	
9.	Name of Directors	:	
10.	Type of Unit	:	
11.	Nature of Project	:	Potato Chips Processing
12.	Installed Capacity at 100% Capacity Utilisation	:	500 Ltr/hr.
13.	Cost of the Project	:	240 Lakh
14.	Promoter's Contribution	:	
15.	Proposed Term Loan	:	
16.	Requirement of Cash Credit Limit	:	
17.	Proposed Employment	:	Direct Employment - 14 nos.
18.	Power Load	:	200 KvA

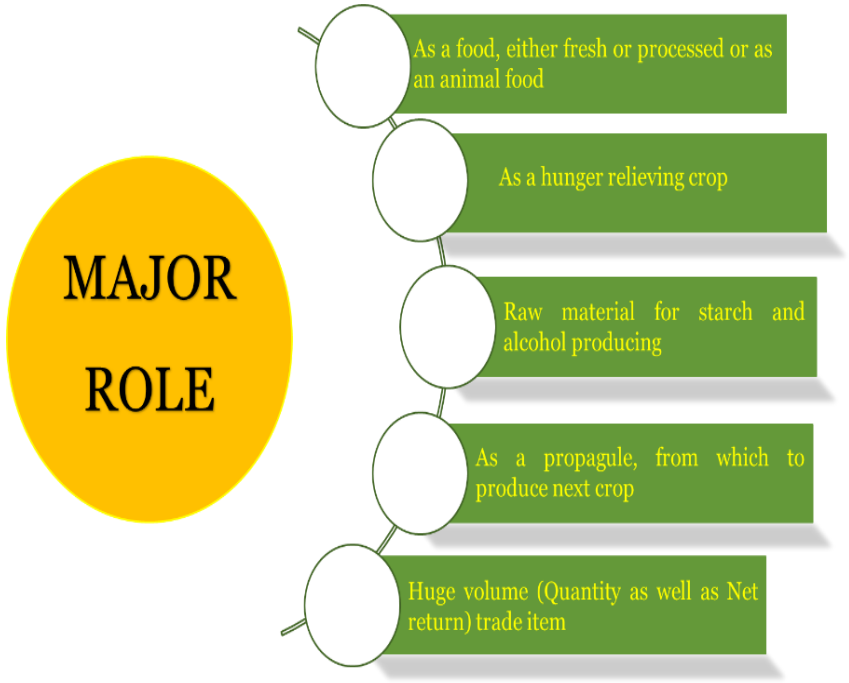
Introduction

Before declaring 2008 as the International Year of Potato, FAO was precisely assessed the significance of potato as future crop for fighting hunger and poverty. Role of potato as food and income security crop for the global poor in general and the residents of developing countries in particulate, was adequately documented by many researchers.[1]

The potato (Solanum tuberosum) being a staple food of humanity is one of the world's major agricultural crops and is the most important and versatile food around the globe. It is the world's fourth significant food crop after wheat, rice and maize because of its higher yield potential along with high nutritive value. With an annual global production of about 370 million tonnes[2], potato is an economically important staple crop in both developed and developing countries.

In comparison with other food crop, it yields more protein and calories per unit area per unit time and per unit of water. It also comprises phosphorus, calcium, iron and some vitamin A & C. The protein calorie ratio is high. It is versatile, carbohydrate-rich food, highly popular worldwide and prepared and served in a variety of ways, making them a good source of energy. Freshly harvested, it contains about 80 percent water and 20 % dry matter. About 60 to 80 %of the dry matter is starch. As a food item, potato has widespread acceptance across cultures and social classes and plays major role in day today life.

Being a cool season vegetable, it is a perishable commodity and cannot be preserved longer in fresh form. Although for some time potatoes can be preserved at cold storage units but this low temperature storage results in many undesirable biochemical changes in the quality of the potatoes. Another alternative for the preservation of them is to conversion in the shelf stable value-added processed products. Further, value-addition and processing of potato will also ensure the availability of wholesome, safe, nutritious, and acceptable food to consumers throughout the year along with simultaneous reduction in post-harvest losses and profit to the farmers for their produce.

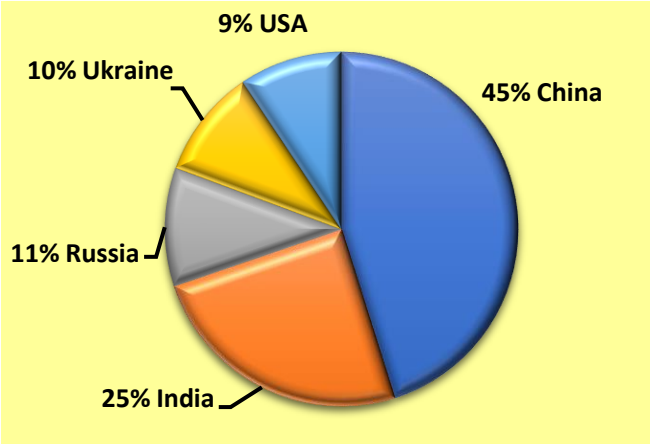


[1] Thiele G, Theisen K, Bonierbale M and Walker T. 2010. Targeting the poor and hungry with potato science. Potato Journal 37(3-4): 75–86.

[2] http://www.fao.org/faostat/en/#data

Global scenario – Potato

Potato, widely known as 'The king of Vegetables' is a major food crop grown by more than 150 countries in the world and more than a billion peoples diet consist of potato. About 370.43 million tonnes of potato are produced in the world over an area of about 17.34 million hectare. Presently China, India, Russia, Ukrain, and U.S.A. contribute to a major share (70%) of the total world production. According to the analysis of FAO, China is the largest producer of potato with the production of 91.88 million tonnes followed by India with more than half of the total potato produced by China.[3]



India scenario – Potato

Being the second largest producer, India occupies a prominent position on world potato map. India produced 50.19 million tones potatoes (13.54% of world production). Since 1990, per capita consumption of Potatoes has risen from around 12 kg to 26kg per year in 2018.[4]

Its cultivation in India not primarily a rural staple but a cash crop that provides significant income particularly to small and marginal landholders and fitted well in the existing cropping system. Potato production in India is highly concentrated in Gangetic plains as three largest potato producing states, viz. Uttar Pradesh (30.33% of national production), West Bengal (24.92% of national production) and Bihar (15.09%of national production), collectively contribute about 70%to the national production.[5]

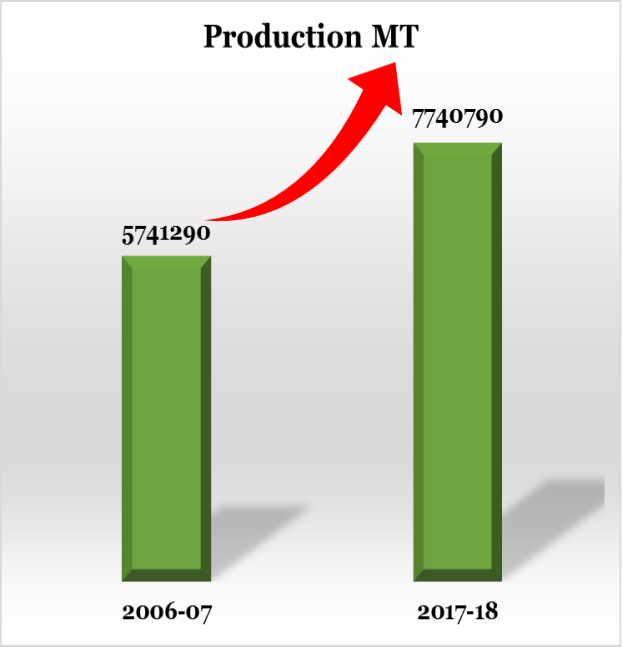
Bihar Scenario

Bihar represents the great Indo-Gangetic plains, one of the most fertile lands of the world. It offers salubrious agro-climatic conditions for Potato Cultivation. It is the fourth major food crop of state after rice, wheat and maize. Although the crop occupies less than five percent of the net sown area across the State, due to its high nutritional value, it is an important source of food for millions of people across Bihar. Production of potato comprises of 7.740 million tonnes which is 48 % of the total production of vegetables produced in the state.[6] The decadal growth in potato production and yield is significantly increasing.

Potato is cultivated all over the Bihar, among which Nalanda, Patna, Vaishali, Saran, Muzaffarpur, Samastipur, Gopalganj, East and West Champaran, and Gaya account for 80 percent of the area. In terms of production, Nalanda, Patna and Vaishali are the foremost districts.

Growing potato also provides excellent opportunities to raise farmers' incomes in Bihar as it has the capacity to yield 5-10 times more than cereals, pulses or oilseeds. The high profitability of potato as a cash crop has made it an economically viable enterprise for small and marginal farmers and has contributed to increasing equity among farmers. Potato provides a high unit return and offers great scope for value addition. In this respect the crop generates high employment during not only during production and harvesting but also processing and marketing

[3] http://www.fao.org/faostat/en/#data/QC
[4] https://www.helgilibrary.com/indicators/potato-consumption-per-capita/india/
[5] http://apeda.in/agriexchange/India%20Production/India_Productions.aspx?cat=Vegetables&hscode=1083
[6] https://agricoop.nic.in/sites/default/files/Horticulture%20Statistics%20at%20a%20Glance-2018.pdf



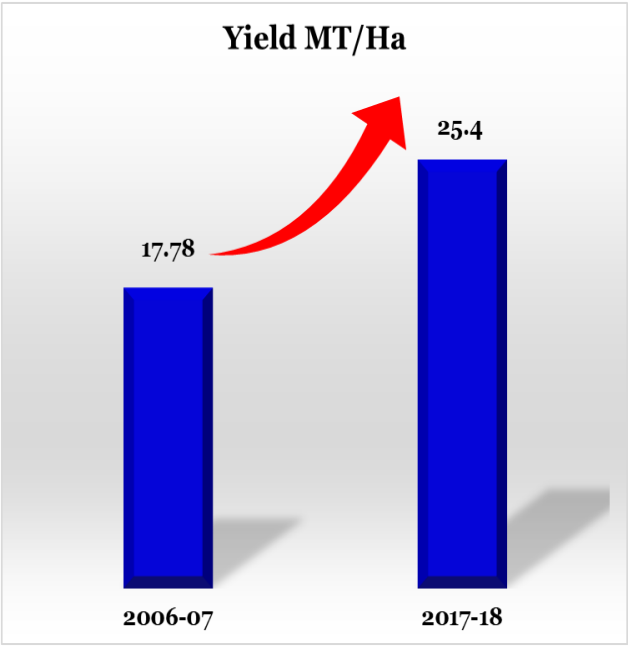


Fig 1 Increase in the production and yield of potato[7] [8]

Increase in production, often resulting in gluts at harvest, has led to several post-harvest issues like storage and proper utilization of the produce. Since potato tubers contain about 80% water, under such environments, a semi-perishable commodity like potato, cannot be stored for more than 3-4 months without refrigeration because of very high losses to the produce due to shrinkage, sprouting and attack by microorganisms. Therefore, these potatoes either need to be stored at low temperatures or processed into some products.

The highest productivity of this crop in the India is the Indo-Gangetic plains region. It is estimated that 25% of the potatoes, which are spoiled due to various reasons such as transportation, type of packing, non-availability of cold storage capacities during harvesting season, glut in the market etc., could be saved by making various preserved potato products. Potato Chips is one of such value-added products which has a great potential as this is considered as one of the traditional foods of India.

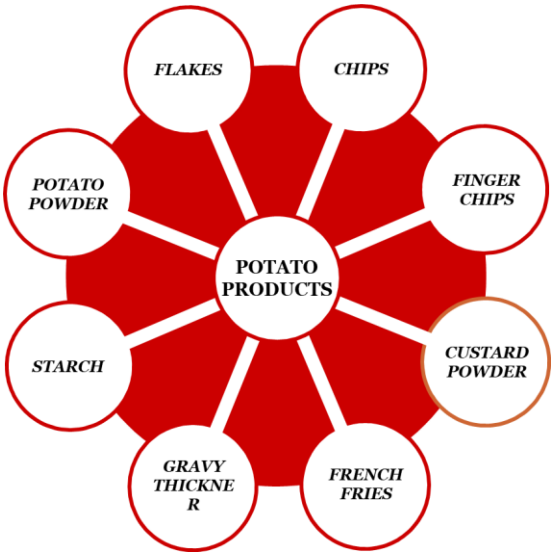
[7] https://agricoop.nic.in/sites/default/files/Horticulture%20Statistics%20at%20a%20Glance-2018.pdf

[8] Singh, S.K. and R.P. Rai, 2011, The Potato Crop in Bihar: Status and Future Challenges, *International Potash Institute, e-ifc No. 27.* https://www.ipipotash.org/uploads/udocs/eifc_no27-rf1.pdf

1. Background

Definition:

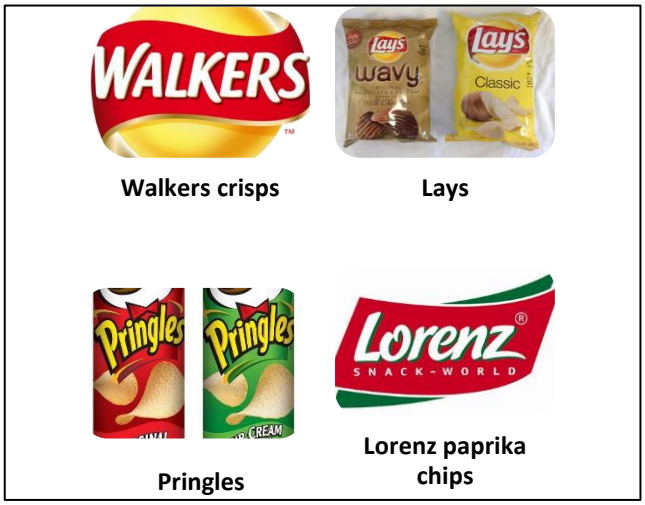
Potatoes is probably the most popular food item of world diet. It is a rich source of starch and contains phosphorus, calcium, iron and vitamins. In merely half a century industrial processing of potatoes into consumer products has developed into a major activity in the potato world. Apart from using fresh potatoes in vegetables and gravy they are dehydrated in the forms of slices and sticks, cubes or powder to impart better shelf life. They are utilized in a variety of ways a:



In an increasingly fast society, there is growing demand for snacks that are easy to buy, store and eat, with an increasing number being eaten 'on the move'. Globally, only two potato-based snack foods i.e., chips/wafers and French-fried potato are the main value-added products of potato, accounting for more than 42% of the potato based processed products. With this background, the potato wafers and chips market seem to hold good growth prospects.

Global Scenario:

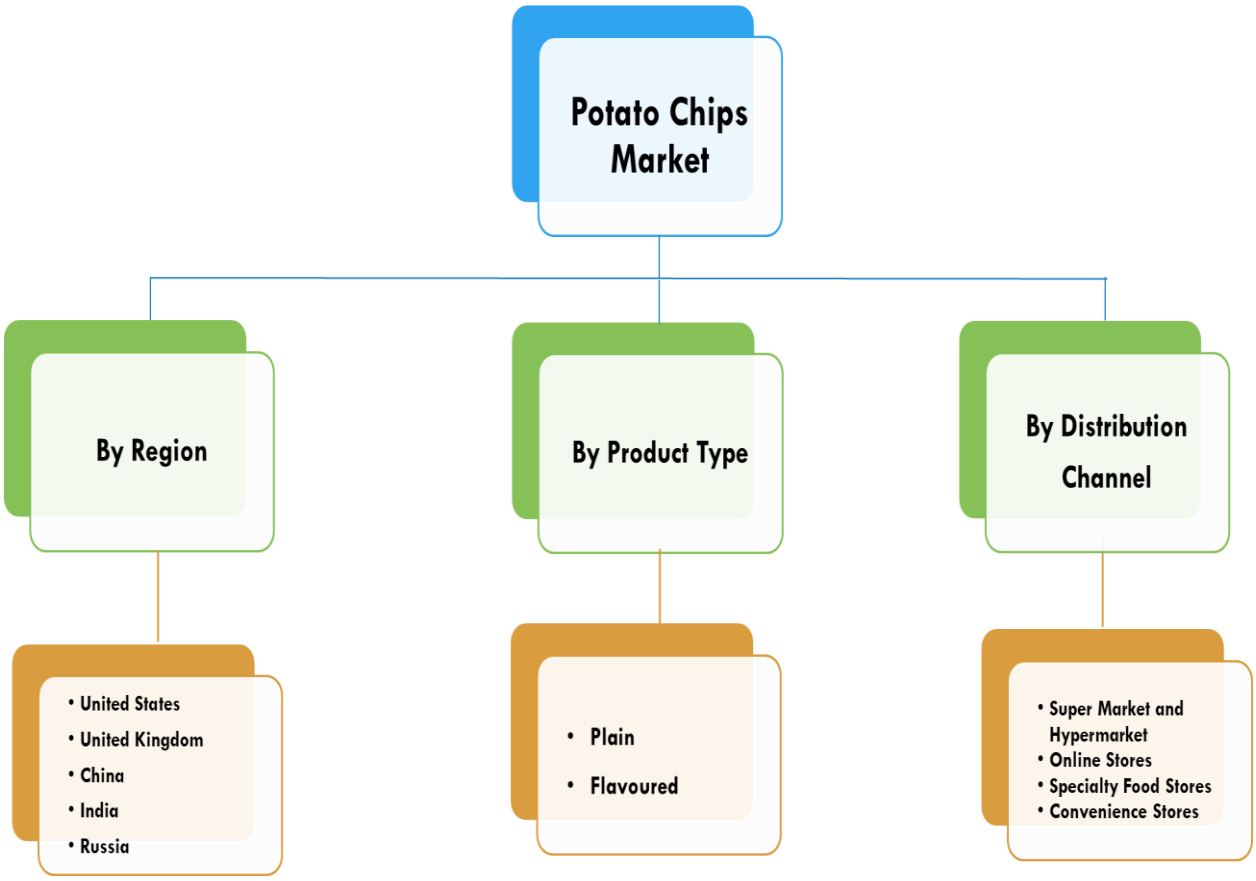
Due to changing lifestyles, consumers are not only opting for easy food options but also looking for authentic and natural snack options with health & wellness attributes, which influencing per capita expenditure in the savory snacks' products including potato chips. Their consumption levels vary extensively across regions across the globe and also has a massive sale in the salty snacks' category. The United States and Western Europe currently represent the biggest markets accounting for nearly two thirds of the total global demand. Growth rates in these markets, however, have reached maturity levels. Additionally, the per capita expenditure on savory snacks products is growing in developing economies such as India and China and is supported by rising disposable income in the countries. Major factors driving the global demand of potato chips are growing urbanization, rise in disposable incomes, large and growing young population and rapidly changing lifestyles. It is going to be one of the lucrative sectors all over the world where the global market reached a value of USD 31.87 billion in 2020. The market is expected to further grow in the forecast period of 2021-2026 at a CAGR of 2.8% to reach USD 36.59 billion by 2026.[9]



The global potato chips market is highly imploding with the presence of numerous small and large manufacturers who compete in terms of prices and quality. Some of the leading players operating in the market are as:

[9] https://www.expertmarketresearch.com/reports/potato-chips-market

Market Segmentation:



Indian Scenario

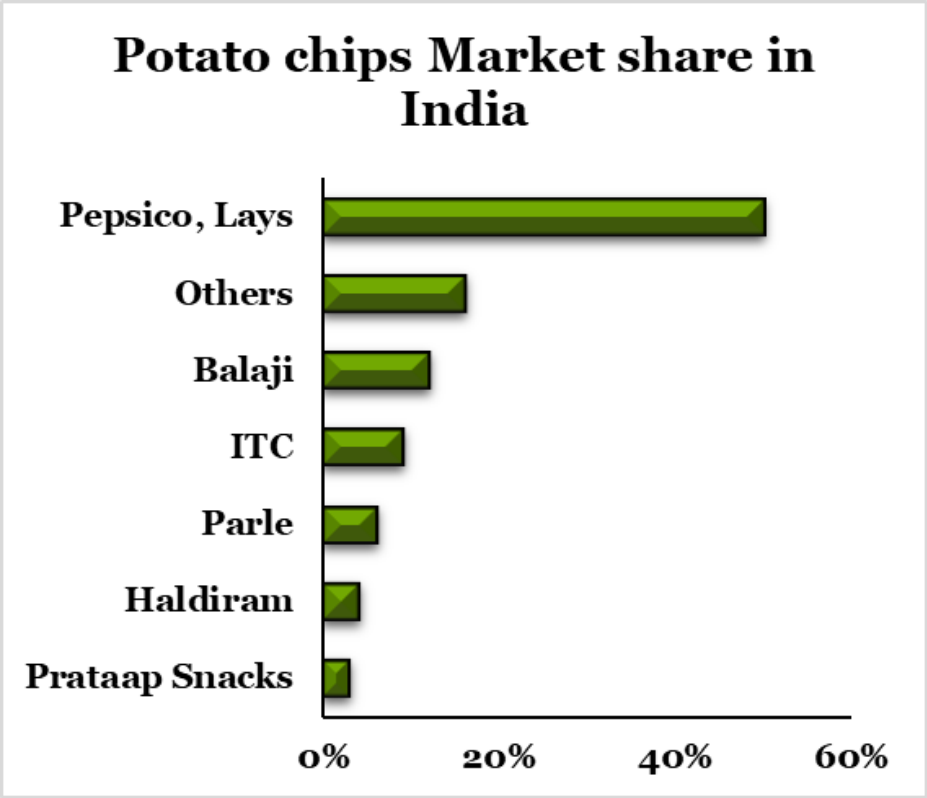
Till the 90's era, Potato processing in India was not in vogue. But in recent years the demand for processed potato products in the country has risen at fast pace due to increased urbanization, rise in per capita income, expanding tourism and with the openings of organized processing by multinationals and indigenous players, potato processing industry has grown manifolds. Presently about 8% of potato production is being used for processing and the major part of potato harvest (approximately 68.5%) goes to domestic table consumption.[10] Whereas, in the developed countries, table potato utilization is merely 31%, rest being frozen French fries (30%), chips and shoestrings (12%) and dehydrated products (12%).

In India, potato processing industry mainly comprises four segments: potato chips, French fries, potato flakes/powder and other processed products. However, potato chips still continue to be the most common and popular processed product

[10] https://indianexpress.com/article/cities/ahmedabad/about-16-of-potatoes-produced-in-country-dumped-as-waste-6241880/

and presently constitute 85% of salty snack business valued at nearly 2.6 billion U.S. dollars in 2017, growing at 18.7 percent to reach 5.5 billion dollars by 2022.[11]

Development of processing cultivars namely Kufri Chipsona-1, Kufri Chipsona-2 and Kufri Chipsona-3 which is now being used by the industries for processing, has accelerated growth in processing sector. The graph shows the share of Potato chips in India where the sale of branded chips sold by manufacturers across India is dominated by a handful of big companies.



Haldiram's 'Chips' brand, the company holds a meagre percent of market share for nationally branded potato chips, tussling with Balaji Wafers (at 16%) and ITC (on 9%), with all three some way behind PepsiCo, which accounts for 50% of sales.[12]

Bihar

Bihar, being the third largest state in production of Potato (7.74 million tonnes) lacks in potato processing. Because it is a vegetarian delicacy and is a part of almost all Bihari culinary dishes. The produce is mostly marketed fresh with negligible processing and value addition. There are no organized processing industries in the state. Less than 1% of the potato is processed in Bihar and appears a great potential of potato processing.

Even though no production and consumption figures are available for this segment in the state, industry estimates suggest that there are large numbers of players, over 1,000, mainly in the unorganized sector. While the unorganized sector caters to mainly the rural markets, the national brands and large players mainly cater to the urban markets. The unorganized sector is burdened with the use of low, dated technologies, which presents issues of food safety, quality and lower recovery. As a matter of the fact with proper development of markets, cold storages, transportation and processing, potato products can be marketed to other states and even to foreign countries, which will improve the farmer's income.

[11] https://www.statista.com/statistics/562644/market-share-of-potato-chips-in-india-by-company/
[12] https://www.statista.com/statistics/562644/market-share-of-potato-chips-in-india-by-company/#statisticContainer

Therefore, in recent years, a sharp rise in potato chips consumption have encouraged Bihar farmers to shift towards potato cultivation and its processing, leading to its adoption in maximum part of Bihar So, there is wide scope of increasing chips production in Bihar towards achieving the goal of doubling farmers income through cultivation and processing.

2. Project Background

Potato is a perishable commodity and its harvest time (Feb/March) tailed with steep rise in temperature in the Bihar. From April onwards, temperatures in the state start shooting up and the produce has either to be consumed within a short period or is required to be shifted to the cold stores. Due to inadequate, expensive and unevenly distributed refrigerated storage facilities, there are frequent gluts in the market causing substantial economic loss to the farmers and wastage of precious food. Under the existing circumstances, processing of the potato into various processed products is a viable option which can help to extend the shelf-life, reduce the post-harvest losses, solve the problem of storage, cater to consumer preferences belonging to different age groups and social strata and serve as a means to increase the supply in off seasons thus maximizing the potato utilization and increasing the farmers income.

Demand for chips continues to rise at significant rate worldwide with the emerging trend of westernization of food consumption patterns in addition to growing economy, rise in middle class population and increasing urbanization. Moreover, with the increase of infrastructure development such as metro station, cinema halls, airport and others, the demand is expected to rise further in the developing countries particularly in India. Production of chips is increasingly moving to domestic production in many parts of state, and therefore opens opportunities for sourcing of ingredients from domestic production.

The main objective of the potato chips making is to ensure a supply chain that meets their ever-increasing demand for high-quality products in its healther form that may be stored and supplied to different markets locally as well as globally throughout the year. Processing not only helps in changing its forms which are easy to use and convenient to prepare any other products but also increases its shelf life.

Proposed project would include warehouse for storage, processing and packing facilities of chips. This unit will be equipped with modern machineries for cleaning, sorting, grading, processing and packing equipment. Standard packaging will be done to retain the quality of the product and increase shelf life and will fetch better price of the produce. After processing, the products would be supplied to the market through distributors/ wholesalers/ retailers.

Current status of the unit:

a. **Items to be manufactured: Potato Chips**

b. **Capacity of the plant**: 500 Ltr/hr.

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

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

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

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

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

h. **Employment Generation:**14 nos.

i. **Marketing:**

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

3. Organizational and Promoters Details

Organizational details

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

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

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

Promoters' Background

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

Brief profile of promoters is given below:

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

c) **Mr. DEF**

Networth: The details of the networth of the unit is given below:

Particulars		Rs. In lakh
Movable assets	A	
	B	
	C	
	Subtotal (A)	
Immovable assets	A	
	B	
	C	
	Subtotal (B)	
	Total	

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

4. Project Description & Flow Sheet:

Chips are very popular amongst all age groups especially young population. This industry is very large and is dominated mainly by local manufacturers. Easy availability, freshness and competitive price are the main features. These products can be made anywhere, where there is availability of raw material without much difficulty.

Processing technology for the unit has been chosen carefully keeping in mind the best practices observed in India and local processes that may add unique value to the final produce. The proposed technology has also taken into consideration the market factors affecting the quality of the final produce.

Details of the technology and process are given below:

The proposed project would procure the raw materials either from local market or from the farm level. After processing, the products would be supplied to the market through distributors/ wholesalers/retailers. The Potato Chips Processing is differentiating with three different models as per the project suitability

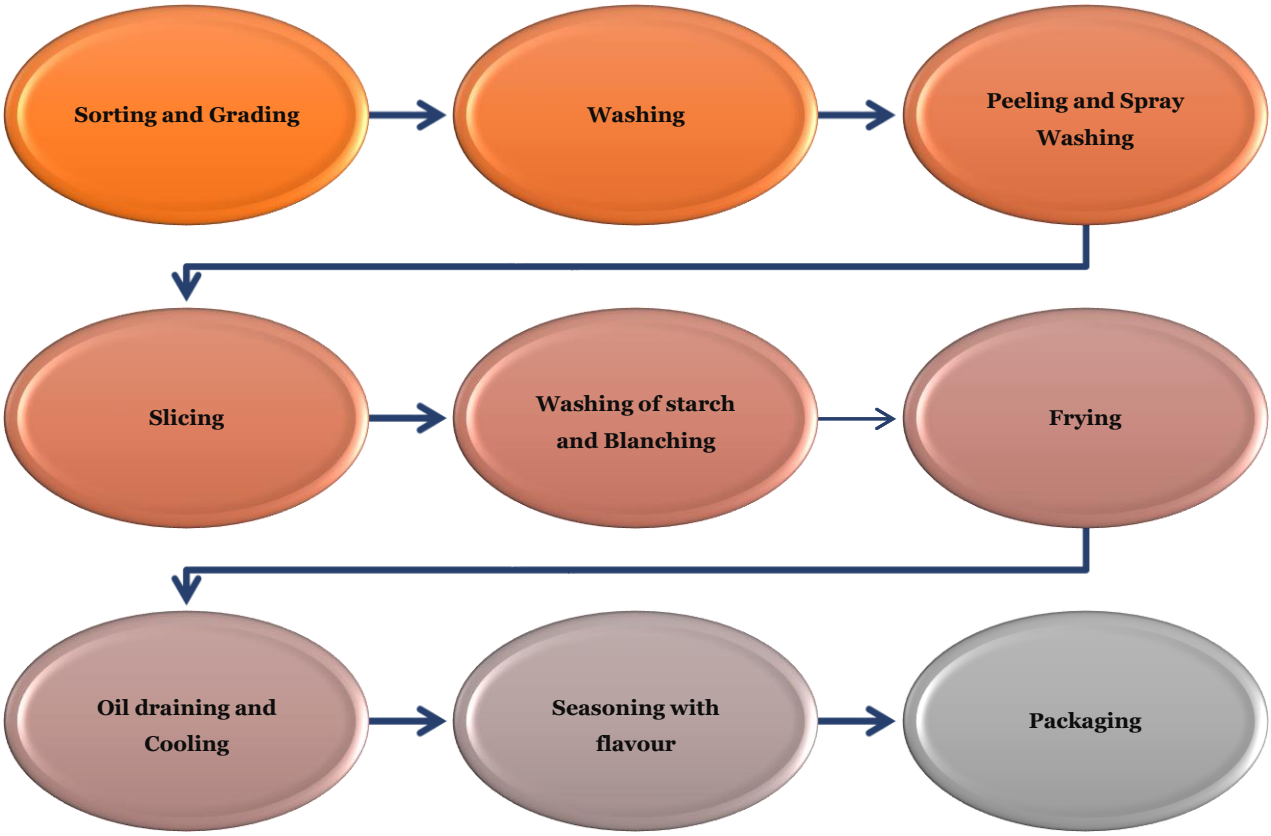
- Manual potato chips line
- Semi-automatic potato chips processing line
- Fully-automatic potato chips production line

Manual Potato Chips processing:

The low-end chips Processing technology has been suggested for Manual potato chips line. The first step taken out is grading and sorting of potatoes so that the damaged potatoes are taken out manually. The potatoes are washed thoroughly under running water and peeled by means of an abrasive potato peeling machine. The peelings are washed away with sprays of water. They are then trimmed and placed in water to prevent browning. After that using slicing machine slices (1.7-1.85 mm. thick) are made. The slices are again placed in cold water whenever there is considerable delay in the subsequent operations of blanching. Then slices are kept in water containing0.05% potassium metabisulphite to avoid oxidation. The slices are blanched for 3 to 5 minutes in boiling water and spread on trays at the rate of 4.88 kg. to 7.30kg. per square meter of tray surface. The blanched chips are then subjected to D-Watering machine to remove excess of water and fried in edible oil at 180-240ºC, for 3-4 minutes. The fried potato wafers are then kept on the sieve to remove excess of oil, cooled and other ingredients like salts, spicy mixture is sprayed as per required taste using batch type flavoring machine. Cooled potato chips are then packed in polythene bags and sealed.[13]

Manual Potato Chips Processing Line Operating Model Flow-Chart

[13] https://www.nedfi.com/sites/default/files/Project_Profile/Potato%20and%20Banana%20Chips.pdf



Semi-automatic Potato Chips processing

A semi-automatic potato chip processing line has similar functions as that of fully automatic potato chips production line. It is a combination of batch & continuous processing arrangement, specially designed for small and medium scale chip manufacturer. It is an economy line in which all major operations are automated except peeling and slicing rest of process is similar like Manual potato chips line.

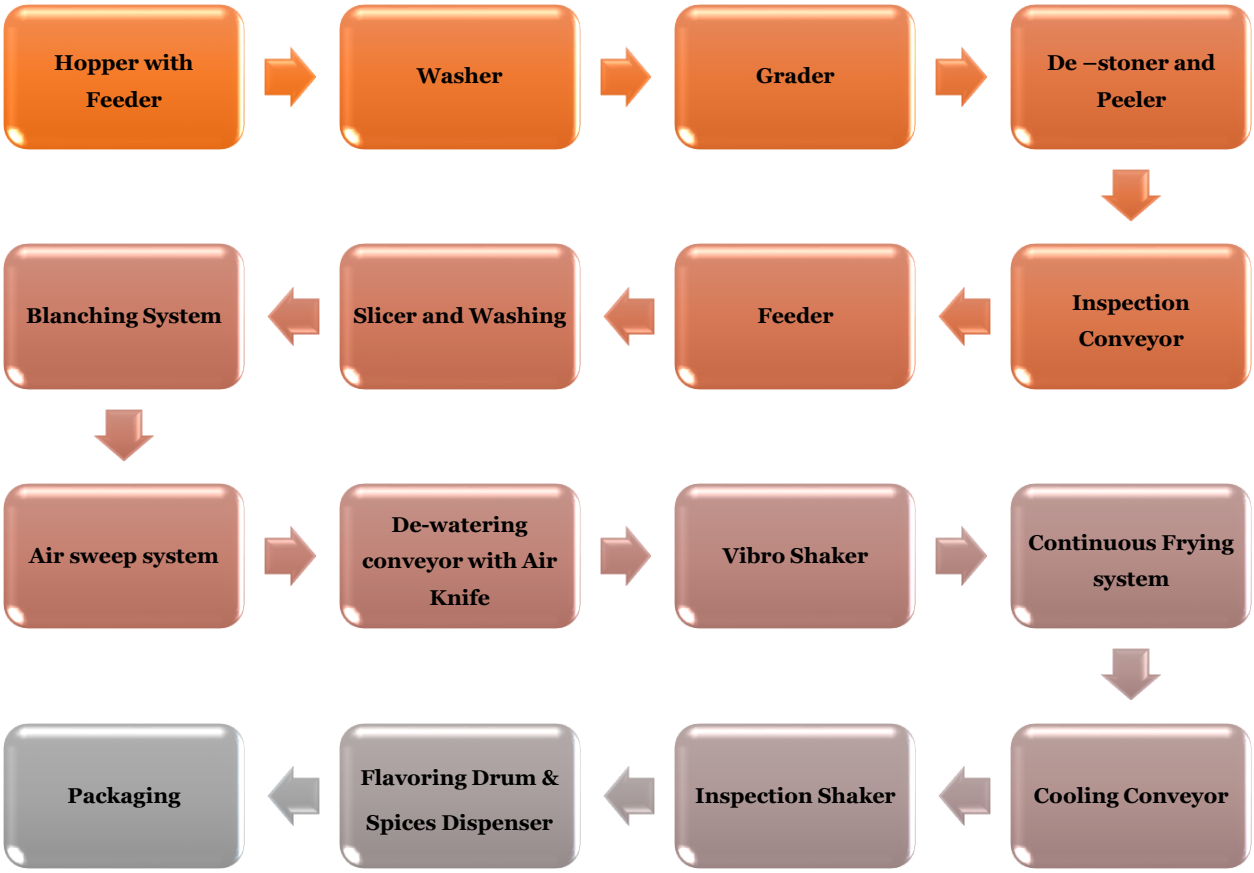
Fully automatic potato chips production line processing

The fully automatic Potato Chips line is a continuous processing arrangement, mainly designed for processing into delicious potato chips and packaging of it with excellent quality and less fat pickups.

In this model, as the potatoes arrive at the plant, they are examined and tasted for its quality. Some are punched with holes in their cores so that they can be tracked through the cooking process. The potatoes are also examined for green edges and blemishes. The pile of defective potatoes is weighed; if the weight exceeds a firm's present allowance, the entire truckload can be rejected. The potatoes move along a conveyer belt to the various stages of manufacturing. The conveyer belts are powered by gentle vibrations to keep breakage to a minimum.

Fully automatic Potato Chips Processing Line Operating Model Flow-Chart[14]

[14] https://www.economodefood.com/potato-chips.html



- **Destoning and peeling**

In this unit, potatoes laded into screw conveyer where they are pushed to the automatic peeling machine for peeling. After this they are washed with cold water.

- **Slicing**

Slicing is done through a revolving impaler/presser that cuts them into paper-thin slices (Size 1.7-1.85 mm). Regular size chips were made using Straight blades while ridged chips by rippled blades. After that, the starch released during slicing is removed by cold water wash. Recently some manufacturers, who market their chips as natural and healthier, do not wash the starch.

- **Color treatment**

At this stage, the potato slices are immersed in a solution that has been adjusted for pH, hardness, and mineral content treated to enhance their color and appearance.

- **Frying and Flavoring**

Before frying, the slices pass under air jets which remove excess water and later they conveyed into oil troughs. The oil temperature is kept at 180-240ºC. Paddles gently push the slices along. As the slices flip-flop, salt is sprinkled over it through the receptacles positioned above the trough at the rate of 0.79kg per 45.4 kg of chips.

- **Cooling and sorting**

A wire mesh belt pulls out the hot chips from oil trough and moved along the mesh conveyer belt where excess oil is drained off and the chips begin to cool. They then move under an optical sorter that picks out damaged and any burnt slices and removes them with puffs of air.

- **Packaging**

The chips are packed into standard sized bags. Its also fully automatic procedure. The filling process must be accomplished without letting an overabundance of air into the bag, while also preventing the chips from breaking. Many manufacturers use nitrogen to fill the space in the bags. The sealed bags are conveyed to a collator and hand-packed into cartons. These days, awareness on environmental cleanliness, companies pack potato chips in paper cans of various sizes.

5. Quality standards and control

Standard Specifications

It has been observed that all varieties of potato are not suitable for processing. The dry matter and reducing sugar content are two important parameters for selecting raw materials for processing. The varieties namely Kufri Chipsona-1, Kufri Chipsona-2, Kufri Chipsona-3, Kufri Chipsona-4, Kufri Frysona and Kufri Himsona released by Central Potato Research Institute (CPRI), Shimla, have been found fit and beneficial for potato processing. The following are the characteristics of potato meant for processing purposes:[15]

Particulars	Specifications
Tuber Shape	Round to Oval
Tuber Size, mm	45-80
Eyes	Shallow
Specific Gravity	>1.08
Dry Matter, %	>20
Reducing Sugar, % fr Wt	<0.1
After Cooking Discoloration	-
Texture	Fairly fi rm to mealy

Specifications under Bureau of Indian Standard related to processing of Chips may be referred as:

IS: 4626-1978
IS: 2860-1964
IS: 7254-1974

The Food Safety and Standards (Licensing and Registration of Food Businesses) Regulations 2011 introduced to improve the quality, hygiene and cleanliness of food has brought about tremendous changes in the food industry. As per the Act, no person shall commence any food business except under a FSSAI license or FSSAI registration. Therefore, any food manufacturing or processing or packaging or distributing entity is now required to obtain a FSSAI License or Registration. It is issued by the Food Safety and Standards Authority of India (FSSAI), Ministry of Family Health & Welfare, Government of India.

[15] Post-Harvest Manual for Export of Potatoes, APEDA, New Delhi

For quality control, samples are chosen hourly from each batch throughout the manufacturing process. The tasters check the chips for salt, seasoning, moisture, color, and overall flavor. Color is compared to charts that show acceptable chip colors.

Pollution Control

In terms of Air and Sound pollution, no major problem is associated with this project. For wastewater disposal, appropriate recycling system is managed so that water pollution will be controlled. However, entrepreneur should obtain NOC from concerned State Pollution Control Board.

Waste and Effluent Disposal

Rejected potatoes and peelings are sent to farms to be used as animal feed while the starch that is removed in the rinsing process is sold to a starch processor.
In case of effluent disposal, it should be treated with recycling facility or dumped in such a way that these does not cause environmental hazard in the vicinity of the site.

Energy Conservation

Proper care and management should be taken in order to use appropriate amount of fuel and electricity.

6. Procurement strategy of raw material & other inputs

Potato is the fourth major food crop after rice, wheat and maize in Bihar. Bihar produces various varites of potatoes in large quantity among which Kufri Chipsona-1, Kufri Chipsona-2 and Kufri Chipsona-3 are cultivated in limited area for processing purpose. Nalanda, Patna, Vaishali, Saran, Muzaffarpur, Samastipur, Gopalganj, East and West Champaran, and Gaya account for 80 percent of the area and production in the state. Among these Nalanda, Patna and Vaishali are the foremost districts for production. Normally prices of fresh potato at the village level are much lower compared to that in the main wholesale market. This situation leads to farmers getting much less return on their produce. So, Potato's which will be required for manufacturing will be procured directly from the farmers. During the season as they are readily available in fresh form hence procurement will not be a problem. Many small auction centers operated at village level that collect the potato from the farmers and is further sold/ dispatched to other major market/ customers in the state and other state. In addition to this unit would also propose to sign contracts with the local farmers to ensure timely supply of the potato.

Backward Linkages:

The promoter has well established backward linkages for its proposed units and it is expected that the raw material can be procured from the local area. Raw materials are mainly Potato, Salt, Flavour and Spices etc.

Forward Linkages

Potato Chips has a great demand not only in the Town but also in the rural area. At present there are only few units who are manufacturing chips in organized way and other unites are very small capacity and are in unorganized sector and unable to fulfill the Market demand. The promoter has very good connect with the buyers and as he was already in the trading business of Namkeen so he is well aware of entire supply chain.

7. Marketing strategy

The rising number of health-conscious consumers is giving a boost to RTS juices; it has been observed that consumers are shifting to RTS as they consider the same as a healthier breakfast/snack option. Mango drinks are popularly used in most urban households.

Today markets are flooded with a large variety of juices e.g., mango, apple, guava, litchi, grapes, pineapple etc. The main reason for increased consumption is rising level of health consciousness among consumers and parents. It is believed that these drinks provide superior nutrition because of their fortified status. Factors like preferred choice of children, easy availability, convenience, naturalness and marketing strategies have given RTS drink industry a booming growth.

With changing lifestyles and increase in disposable incomes, the demand for easy-to- prepare drink is also increasing. Besides consumption in the households, it is served in hotels, restaurants, clubs, airlines and railways etc.

Quality should be emphasized at each step right from the beginning to the marketing of the Product. Over the years, an image of high-quality products should be cultivated.

The effectiveness of distribution coverage and practice is of paramount importance in achieving the desired RTS juice sales. Understanding of the distribution channels is crucial for the manufacturer to plan and implement an effective distribution strategy. Distribution network should be given extra emphasis. Market share could be gained by enhancing retailer, and distributor margins. Normally distribution and retailer margins in RTS juice business are from 15 to 20%.

Promoters would appoint distributors in targeted towns of Bihar and surrounding states like West Bengal, Jharkhand, Uttar Pradesh. Contacts with retailers of similar kinds will be made and products would be sold in the market with help of them. The product made in this unit will be in the line with top range of products with better quality at the same time cost effective. Company would be sharing more profits with the distributors and retailers.

Company will also explore possibility of marketing their produce to retails shops like Big Bazar, Reliance Trends, Malls etc. It will also try to partnership with local and other hotels and restaurants with good offers to attract demand of its product. It is assumed that due high quality, cost effectiveness and aesthetic packaging, sale of products may not face much problems.

8. Land Details

Land Details

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

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

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

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

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

(In case of leased land the minimum lease duration should be 30 years)

ECONOMICS OF THE PROJECT						
a	**BASIS OF PRESUMPTIONS**			**:**		
	No. of Working Days per Annum			:		300
	No.of Working Shift(s) per day			:		Single
	No.of Working Hours per shift			:		8
b	**PRODUCT(S) MIX, CAPACITY & ITS UTILISATION:**					
				Average		
	Product	***Units***	***Qty.***	***Selling Price***		***Amount,***
				(Rs./Unit)		***(Rs.in Lakh)***
	Potato Chips	tons	150	175000		262.50
		tons	150			262.50
	Capacity Utilisation			:		
	First Year of operation			:	40	%
	Second Year of operation			:	50	%
	Third Year of operation			:	60	%
	Fourth Year of operation			:	65	%
	Fifth Year & onwards years					
	of operation			:	70	%

c **PREMISES**

a Plot Size: 100 sq. mt.

b Location

c Covered Area 60 sq. mt.

	MACHINERY AND EQUIPMENT:				
S. No.	***Description***	***Qty. Nos.***	***Rate (Rs.Lakh)***	***Amount (Rs.in Lakh***	***)***
A	**Washing Section**				
1	Reel Machine	1	1.00	1.00	
2	Separator	1	1.50	1.50	
3	Emery Ruler Machine	1	0.90	0.90	
4	Elevator	3	0.60	1.80	
5	Low Pressure Pan	2	0.60	1.20	
6	Drum	3	0.40	1.20	7.60
B	**Grinding Section**				
7	Grinding Machine	1	3.00	3.00	
8	Plant Separator	1	2.50	2.50	
9	Vibro Purifier	1	2.00	2.00	
10	High Pressure Fan	1	0.75	0.75	
11	Finisher Machine	1	1.00	1.00	9.25
C	**Plant Section**				
12	Ekoter Machine	1	3.30	3.30	
13	Spices Mixer	1	1.00	1.00	
14	Pneumatic Packing Machine	1	2.00	2.00	
15	Compressor	1	1.00	1.00	
16	Motors & Electrical Goods	1	2.00	2.00	9.30
		Total	**Rs.**	**26.15**	**Lakh**

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

Misc. Fixed Assets

Additionally, following misc. fixed assets are also required for the proposed project

S. No.	Particulars	Amout (Rs. Lakh)
a.	Furniture and Fixtures	0.50
b.	Fire Fighting & Other Safety Equipment	0.25
c.	Misc. (Storage Racks)	0.25
	Total	**1.00**

Project Cost

Project Cost		
S. No.	**Particulars**	**Amount (Rs. Lakh)**
1	Civil work	0.00
2	Machinery & Equipment	26.15
3	Misc. fixed assets	1.00
4	Preliminary & pre-operative expenses	0.64
5	Security deposits	0.83
6	Working capital	4.07
	Total	**32.69**

	TERM LOAN					
		: Rs.		**Lakh**		
S. No.	***Description***	***Value***		***Term***	***Loan***	
1).	Premises	Owned				
2).	Machinery & Equipment	26.15	75	%	19.61	
3).	Misc. Fixed Assets	1.00	75	%	0.75	
	Term Loan Eligibility	**27.15**		**Rs.**	**20.36**	**Lakh**
	Term Loan to be applied for			**Rs.**	**19.42**	**Lakh**

i	**TERM LOAN, ITS REPAYMENT AND INTEREST SCHEDULE**					
		Term Loan	: Rs.	19.42	Lakh	
		Repayment Period		4.5	Years	
		Moratorium Period		6	months	
		Annual Interest Rate		10.50	%	
Year/Month		***Opening Balance***	***Principle Repayment***		***Closing Balance***	***Interest***
lst Year	1	1942000	0		1942000	16993
	2	1942000	0		1942000	16993
	3	1942000	0		1942000	16993
	4	1942000	0		1942000	16993
	5	1942000	0		1942000	16993
	6	1942000	0		1942000	16993
	7	1942000	35963		1906037	16835
	8	1906037	35963		1870074	16520
	9	1870074	35963		1834111	16206
	10	1834111	35963		1798148	15891
	11	1798148	35963		1762185	15576
	12	1762185	35963		1726222	15262
				215778		198246
2nd Year	1	1726222	35963		1690259	14947
	2	1690259	35963		1654296	14632
	3	1654296	35963		1618333	14318
	4	1618333	35963		1582370	14003
	5	1582370	35963		1546407	13688
	6	1546407	35963		1510444	13374
	7	1510444	35963		1474481	13059
	8	1474481	35963		1438519	12744
	9	1438519	35963		1402556	12430
	10	1402556	35963		1366593	12115
	11	1366593	35963		1330630	11800
	12	1330630	35963		1294667	11486
				431556		158597

i	**TERM LOAN, ITS REPAYMENT AND INTEREST SCHEDULE (Contd….)**				
Year/Month		***Opening Balance***	***Principle Repayment***	***Closing Balance***	***Interest***
3rd Year	1	1294667	35963	1258704	11171
	2	1258704	35963	1222741	10856
	3	1222741	35963	1186778	10542
	4	1186778	35963	1150815	10227
	5	1150815	35963	1114852	9912
	6	1114852	35963	1078889	9598
	7	1078889	35963	1042926	9283
	8	1042926	35963	1006963	8968
	9	1006963	35963	971000	8654
	10	971000	35963	935037	8339
	11	935037	35963	899074	8024
	12	899074	35963	863111	7710
			431556		113283
4th Year	1	863111	35963	827148	7395
	2	827148	35963	791185	7080
	3	791185	35963	755222	6766
	4	755222	35963	719259	6451
	5	719259	35963	683296	6136
	6	683296	35963	647333	5822
	7	647333	35963	611370	5507
	8	611370	35963	575407	5192
	9	575407	35963	539444	4877
	10	539444	35963	503481	4563
	11	503481	35963	467519	4248
	12	467519	35963	431556	3933
			431556		67970

i	**TERM LOAN, ITS REPAYMENT AND INTEREST SCHEDULE *(Contd….)***				
Year/Month		***Opening Balance***	***Principle Repayment***	***Closing Balance***	***Interest***
5th Year	1	431556	35963	395593	3619
	2	395593	35963	359630	3304
	3	359630	35963	323667	2989
	4	323667	35963	287704	2675
	5	287704	35963	251741	2360
	6	251741	35963	215778	2045
	7	215778	35963	179815	1731
	8	179815	35963	143852	1416
	9	143852	35963	107889	1101
	10	107889	35963	71926	787
	11	71926	35963	35963	472
	12	35963	35963	0	157
			431556		22657

k	**RECURRING EXPENSES**					*(Rs. in Lakh)*	
			1st Yr.	***2nd Yr.***	***3rd Yr.***	***4th Yr.***	***5th Yr.***
		Days					
a.	Consumables	6	1.37	1.71	2.05	2.22	2.39
	Bank Finance	75%	1.02	1.28	1.54	1.66	1.79
b.	Work in progress	2	0.49	0.62	0.75	0.81	0.87
	Bank Finance	75%	0.37	0.47	0.56	0.61	0.65
c.	Finished Goods in Stoc	2	0.58	0.58	0.71	0.85	0.92
	Bank Finance	75%	0.43	0.43	0.53	0.63	0.69
d.	Accounts Receivables	15	5.25	6.56	7.88	8.53	9.19
	Bank Finance	60%	3.15	3.94	4.73	5.12	5.51
e.	Misc.Expenses	30	1.81	2.16	2.46	2.69	2.93
	Bank Finance	0%	0.00	0.00	0.00	0.00	0.00
	Total		9.50	11.62	13.84	15.09	16.29
	Less:SundryCreditors	2	0.46	0.57	0.68	0.74	0.80
	Recurring Expenses		9.04	11.05	13.15	14.35	15.49
	Bank Finance		4.98	6.12	7.35	8.02	8.65
	Margin Money		4.07	4.94	5.80	6.33	6.85

STAFF & LABOUR REQUIREMENTS AND ANNUAL SALARIES/WAGES BILL

S. No.	Designation	Nos.	Rate p.m.	Amount (Rs.)	(Rs.in Lakh)
Office Staff					
1	Accountant	1	15000	1.80	
2	Sales & Marketing	2	20000	4.80	
3	Peon/Watchman	1	10000	1.20	7.80
		4			
a.	Supervisory				
		1	25000	3.00	3.00
	`	1			
b.	Workers				
1	Skilled Operators	2	15000	3.60	
2	Semi-skilled Workers	2	12000	2.88	
3	Unskilled Labour	4	10000	4.80	11.28
		8		22.08	
	10% benefits			2.21	
		13	Rs.	24.29	Lakh

Note:- More than 75% of local persons to be employed

I	**ANNUAL COST OF RAW MATERIALS, CONSUMABLES**						
	& PACKAGING MATERIALS		(at 100% efficiency)				
	Following Raw Materials, Consumables & Packaging materials are required						
	for the proposed project:						
S.No.	***Description***						
1	Fresh Potatoes			}			
				}			
2	Edible Oil (refined groundnut oil)			}			
				}			
3	Spices & other consumables			}			
				}		60.00	%
4	Misc.Consumables			}	of sales value		
5	Packing Materials			}			
	Printed Flexible Tubular Films			}			
	Printed Corrugated Boxes			}		5.00	%
	Printed Card Board Hangers			}	of sales value		
	Tape rolls, bar coading stickers			}			
	straping belt, doughler etc.			}			
	Cost of raw materials, consumables and packing materials						
	is assumed at		65.00	% of annual revenues.			
				Total	**Rs.**	**170.63**	**Lakh**
	Year-wise cost of Raw Materials, Consumables & Packing Materials:						
					Rs. in Lakh		
	1st Yr.	***2nd Yr.***	***3rd Yr.***	***4th Yr.***	***5th Yr.***		
	68.25	85.31	102.38	110.91	119.44		

ANNUAL COST OF UTILITIES (POWER & WATER)

(at 100% efficiency)

a. Power

Total Load		15	HP		
		11	KW		
Consumption		Load x 8 x 300 x 0.75 Hrs.x Days x Power Factor			
Source:		20142	KWH		
Govt.	75%	15106.5	KWH		
Rate	Rs.	9.00	KWH	1.36	Lakh
Generator	25%	5035.5	KWH		
Rate	Rs.	15.00	KWH	0.76	Lakh
Total Power Bill		Rs.	2.11	Lakh	

Water

Water	300	KL			
@ Rs.	25.00	per KL			
		Rs.	0.08	Lakh	

Total Power & Water Bill Rs. 2.19 Lakh

DEPRECIATION CHART

Machinery & Equipment	:	Rs.	26.15	Lakh
Misc. Fixed Assets	:	Rs.	1.00	Lakh

S.No.	*Description*		*1st Yr.*	*2nd Yr.*	*3rd Yr.*	*4th Yr.*	*5th Yr.*
1).	Machinery & Equipment		26.15	22.23	18.89	16.06	13.65
	Depreciation rate	15%	3.92	3.33	2.83	2.41	2.05
			22.23	18.89	16.06	13.65	11.60
2).	Misc.Fixed Assets		1.00	0.85	0.72	0.61	0.52
	Depreciation rate	15%	0.15	0.13	0.11	0.09	0.08
			0.85	0.72	0.61	0.52	0.44
	Total Deprecation		**4.07**	**3.46**	**2.94**	**2.50**	**2.13**

REPAIRS & MAINTENANCE

S.No.	*Description*	*1st Yr.*	*2nd Yr.*	*3rd Yr.*	*4th Yr.*	*5th Yr.*
1).	Machinery & Equipment	26.15	22.23	18.89	16.06	13.65
	Repairs/Maintenance					
	Rate (%)	0.50	1.00	1.50	2.00	2.50
	Amount (Rs.Lakh)	0.13	0.22	0.28	0.32	0.34
2).	Misc.Fixed Assets	1.00	0.85	0.72	0.61	0.52
	Repairs/Maintenance					
	Rate (%)	0.50	1.00	1.50	2.00	2.50
	Amount (Rs.Lakh)	0.01	0.01	0.01	0.01	0.01
	Total	**0.14**	**0.23**	**0.29**	**0.33**	**0.35**

INSURANCE

The fixed assets of the project will be insured for all types of risks. Annual insurance Charges payable shall be as under:-

S.No.	*Description*	*1st Yr.*	*2nd Yr.*	*3rd Yr.*	*4th Yr.*	*5th Yr.*
1).	Machinery & Equipment	26.15	22.23	18.89	16.06	13.65
2).	Misc.Fixed Assets	1.00	0.85	0.72	0.61	0.52
	Total	27.15	23.08	19.62	16.67	14.17
	Insurance Charges:					
	Rate (%)	1.00	1.50	2.00	2.50	3.00
	Amount (Rs.Lakh)	0.27	0.35	0.39	0.42	0.43

MARKETING EXPENSES

Marketing Expenses include brokerage, commission, discounts etc.

These are assumed at 2.50 percent of revenues

Year	*1st Yr.*	*2nd Yr.*	*3rd Yr.*	*4th Yr.*	*5th Yr.*
		Rs.Lakh			
Revenues	105.00	131.25	157.50	170.63	183.75
Rate (%)	2.50	2.50	2.50	2.50	2.50
Selling Exps.	2.63	3.28	3.94	4.27	4.59

PROJECTIONS OF PERFORMANCE AND PROFITABILITY STATEMENT

(Rs.in Lakh)

	1st Year	2nd Year	3rd Year	4th Year	5th Year
Capacity Utilisation (%)	40	50	60	65	70
A. Annual Revenues					
Value Rs.Lakh	105.00	131.25	157.50	170.63	183.75
(% increase over last year)		25.00	20.00	8.33	7.69
B. Expenses					
a. Raw Materials,Consum-ables & Packing Materials	68.25	85.31	102.38	110.91	119.44
b. Rent (Premises's)	0.00	0.00	0.00	0.00	0.00
b. Power/Water	0.88	1.09	1.31	1.42	1.53
c. Salaries & Wages*					
Salaries	11.88	13.07	14.37	15.81	17.39
Wages	4.96	6.82	8.19	8.87	9.55
d. Repairs & Maintenance	0.14	0.23	0.29	0.33	0.35
e. Insurance	0.27	0.35	0.39	0.42	0.43
f. Depreciation	4.07	3.46	2.94	2.50	2.13
f. Transportation	2.40	3.00	3.60	3.90	4.20
@ 0.50 Lakh p.m.	92.85	113.34	133.48	144.17	155.02
Expenses	92.85	113.34	133.48	144.17	155.02

* 10% increase every year

PROJECTIONS OF PERFORMANCE AND PROFITABILITY STATEMENT

(Contd.)

(Rs.in Lakh)

		1st Year	2nd Year	3rd Year	4th Year	5th Year
Capacity Utilisation (%)		40	50	60	65	70
C. Gross Profit		12.15	17.91	24.02	26.46	28.73
Selling Expenses		2.63	3.28	3.94	4.27	4.59
Overheads@		1.31	1.64	1.97	2.13	2.30
Preliminary & Pre-operative Expenses w/off		0.13	0.13	0.13	0.13	0.13
Financial Expenses:						
a. Interest on term loan		1.98	1.59	1.13	0.68	0.23
b. Interest on Working Capital Loan 10.50 % p.a.		0.52	0.64	0.77	0.84	0.91
D. Profit *(before taxes)*		5.58	10.63	16.08	18.41	20.57
E. Provision for Taxes	30.90%	1.72	3.29	4.97	5.69	6.36
F. Profit *(after taxes)*		3.86	7.35	11.11	12.72	14.22
Depreciation, added back		4.07	3.46	2.94	2.50	2.13
G. Cash Accruals		7.93	10.81	14.05	15.22	16.34

@ Telephone Bills, Postage/Courier Exps., Travelling/Conveyance, Bank Charges/Commissions, Publicity etc. considered at 1.25 percent of revenues.

BREAK-EVEN-EFFICIENCY ANALYSIS

(Rs.in Lakh)

	1st Year	2nd Year	3rd Year	4th Year	5th Year
Capacity Utilisation (%)	40	50	60	65	70
A. Revenues	105.00	131.25	157.50	170.63	183.75
B. Variable Costs					
a. Raw Materials,Consum-ables & Packing Materials	68.25	85.31	102.38	110.91	119.44
b. Power/Water	0.88	1.09	1.31	1.42	1.53
c. Wages	4.96	6.82	8.19	8.87	9.55
d. Intt.on working capital loan	0.52	0.64	0.77	0.84	0.91
e. Marketing Expenses	2.63	3.28	3.94	4.27	4.59
Total	77.24	97.16	116.59	126.31	136.03
C. Fixed Costs					
a. Rent (Premises's)	0.00	0.00	0.00	0.00	0.00
b. Salaries	11.88	13.07	14.37	15.81	17.39
c. Admn. Overheads	1.31	1.64	1.97	2.13	2.30
d. Repairs & Maintenance	0.14	0.23	0.29	0.33	0.35
e. Insurance	0.27	0.35	0.39	0.42	0.43
f. Interest on term loan	1.98	1.59	1.13	0.68	0.23
g. Depreciation	4.07	3.46	2.94	2.50	2.13
Total	19.65	20.33	21.11	21.88	22.82
D. Contribution	27.76	34.09	40.91	44.32	47.72
E. Break-even-efficiency(%)	70.79	59.64	51.59	49.36	47.82
Average Break-even-efficiency			55.84		

CASH FLOW STATEMENT

(Rs.in Lakh)

	1st Year	2nd Year	3rd Year	4th Year	5th Year
A. Sources of Funds					
1.Increase in share Captial	13.27	0.87	0.86	0.53	0.52
2.Increase in Term Loan	19.42	0.00	0.00	0.00	0.00
3.Increase in Working Capital Borrowings	4.98	1.14	1.24	0.67	0.62
4.Profits before tax with interest added back	8.09	12.86	17.98	19.93	21.71
5.Preliminary Exps.w/off	0.13	0.13	0.13	0.13	0.13
6.Depreciation	4.07	3.46	2.94	2.50	2.13
	49.95	18.46	23.16	23.76	25.11
B. Disposition of Funds					
1.Preliminary & Pre-operative Expenses	0.64	0.00	0.00	0.00	0.00
2.Increase in Capital Expenditure	27.98	0.00	0.00	0.00	0.00
3.Increase in Current Assets	9.04	2.01	2.10	1.20	1.14
4.Decrease in Term Loan	2.16	4.32	4.32	4.32	4.32
5. Interests	2.50	2.23	1.91	1.52	1.13
6. Taxes	1.72	3.29	4.97	5.69	6.36
7. Remuneration/Drawings	5.00	5.50	6.05	6.66	7.32
	49.05	17.34	19.34	19.38	20.27
C. Opening Balance	0.00	0.90	2.02	5.84	10.22
D. Net Surplus/Deficit(-)	0.90	1.12	3.82	4.38	4.83
E. Closing Balance	0.90	2.02	5.84	10.22	15.05

(Rs.in Lakh)

PROJECTED BALANCE SHEET

(Rs.in Lakh)

	1st Year	2nd Year	3rd Year	4th Year	5th Year
A. SOURCES OF FUNDS					
Share Capital	13.27	13.27	13.27	13.27	13.27
Add: Profits	3.86	11.20	22.31	35.04	49.25
	17.12	24.47	35.58	48.30	62.52
(-) Drgs/Remuner.	5.00	5.50	6.05	6.66	7.32
Net Worth	12.12	18.97	29.53	41.65	55.20
Loans					
Term Loan	19.42	17.26	12.95	8.63	4.32
Bank Borrowings	4.98	6.12	7.35	7.35	7.35
Unsecured Loans	0.00	0.00	0.00	0.00	0.00
Sundry Creditors	0.46	0.57	0.68	0.74	0.80
Other Current Liabilities	0.16	0.53	0.62	0.80	0.84
	37.13	43.44	51.14	59.17	68.51
B. APPLICATION OF FUNDS					
Fixed Assets					
Gross Block	27.98	27.98	27.98	27.98	27.98
Depreciation	4.07	7.53	10.48	12.98	15.10
Net Block	23.91	20.45	17.50	15.00	12.88
Plot/Land	0.00	0.00	0.00	0.00	0.00
Current Assets					
Inventories	2.43	2.90	3.51	3.87	4.18
Sundry Debtors	5.25	6.56	7.88	8.53	9.19
Pre-liminary & Pre-operative Exps.not w/off	0.64	0.51	0.38	0.26	0.13
Advances					
Cash & Bank Balance	0.90	2.02	5.84	10.22	15.05
Other Current Assets	4.00	11.00	16.03	21.30	27.09
	37.13	43.44	51.14	59.17	68.51

DEBT SERVICE COVERAGE RATIO

	1st Year	2nd Year	3rd Year	4th Year	5th Year
Profit after tax	3.86	7.35	11.11	12.72	14.22
Depreciation	4.07	3.46	2.94	2.50	2.13
Intt.on Term Loan	1.98	1.59	1.13	0.68	0.23
Total Coverage	**9.91**	**12.40**	**15.19**	**15.90**	**16.57**
Loan Repayment	2.16	4.32	4.32	4.32	4.32
Intt.on Term Loan	1.98	1.59	1.13	0.68	0.23
Total Loan Liability	**4.14**	**5.90**	**5.45**	**5.00**	**4.54**
DSCR	2.39	2.10	2.79	3.18	3.65
Average DSCR			2.82		

9. Project impact

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

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

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

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

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