potatochipsmachinery

Pre-Feasibility Study

POTATO CHIPS MANUFACTURING INDUSTRY INVESTMENT IN PAKISTAN

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1. Summary

The potato chips project involves staring a potato chips manufacturing industry in any big city of Pakistan which will produce premium quality potato chips to be sold in the local market, competing with a few existing brands. The industry will be equipped with modern automated machinery for all the processes in order to ensure the quality of the final products.

The potato chips are recently appeared in Pakistan and have a great market share as the snack food market is represented by different types of biscuits and corn based products in this period. With the improvement of people's life standard and the invasion of satellite, the demand of potato chips is rising. However, high demand and limited supply give a great chance for new chips producers to enter the Pakistan snack food market.

The proposed production capacity of the plant is 150kg potato chips per hour. It will work in two shifts and operate at 50% capacity in the first year. The maximum capacity attained is 95% and the plant would operate at this capacity in the sixth year .

2. Introduction to Pakistan

Pakistan, officially the Islamic Republic of Pakistan, is a sovereign country in South Asia. With a population exceeding 180 million people, it is the sixth most populous country and with an area covering 796,095 k ㎡ (307,374 sq mi), it is the 36th largest country in the world in terms of area. As the country is so big, the climate varies from tropical to temperate. so the wheat production is very high and rice ,cotton are also exported to other countries.

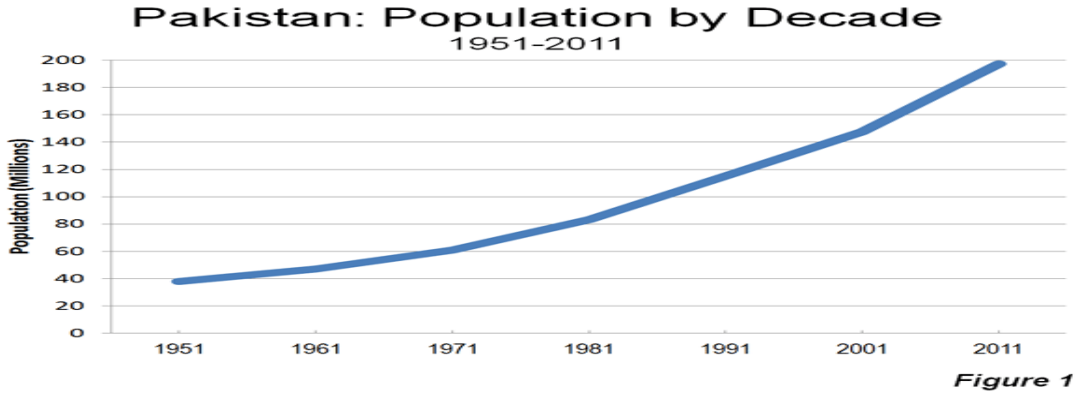


Figure 1

With such climate, the potatoes are harvested three times a year. Potatoes usually exported to other countries. Potato farming systems in Pakistan are comparatively complex and diverse. The northern area of the Pakistan is the main seed producing area and supply seed to the rest of the country. Potato is the only source of income in northern area.

3. Purpose of the Document

The purpose of this pre-feasibility study is primarily to facilitate potential entrepreneurs in project identification for investment. In order to serve this purpose, the document covers the proposed unit setting up, the production line, the market information, marketing, finance and business management, sectoral information and international scenario which have some bearing on the project itself.

Before studying the document, the following SWOT analysis will give critical aspects in setting up a potato chips manufacturing industry. The SWOT analysis is the basis of any investment decision making.

4. Crucial Factors & Steps in Decision Making for Investment

To set up a potato chips manufacturing industry, crucial factors are important to be considered and have a great bearing in decision making.

4.1 SWOT Analysis

SWOT Analysis indicates important marketing information of setting up a potato chips manufacturing industry in Pakistan, including strength, weakness, opportunity and threat. All these critical aspects give a whole market landscape and play an import role in decision making.

Strengths

- Continuous availability of raw material as potatoes in Pakistan are harvested three times a year
- Fully automated plant which requires less labour
- Easy availability of cheap labour
- Tariff cuts under Trade Agreements increases the export market of the potato chips.
- The improvement in living standard and the changed life style increase the demand of potato chips.
- The price of potato chips is affordable to all income groups.
- Great potential market
- Low transaction cost
- The strong agriculture base presents a great opportunity for food business to expand in the future.

Weakness

- Inexperienced technical staff compared with the existed industries
- Expected loss at the beginning stages of the operation

Opportunities

- Improvement in life standard an changes in the current eating habits of the people
- Most of the snack food market about 40% is owned by un-branded chips, which can be captured through market campaign and promotion.
- With the influence of western lifestyles and tastes, youngsters tends more towards snacks, especially potato chips.
- Favorable policy enables potato chips export to the neighbouring countries, such as Afghan, China.

Threats

- Lack of storage facilities leads to fluctuation in price and large production of potatoes wasted.
- With the improvement of life standard, high quality of potato chips are needed.
- Poverty is still very at large in Pakistan.
- Competition exists between the new producers and the already established Multinationals in the potato chips market
- Energy shortage
- High inflation

4.2 Key Success Factors

Referring to key success factors for the proposed project, one of them would be to monitor the whole production process carefully and technically in order to reduce material waste, oil waste and energy waste to save cost.

The marketing and promotion of potato chips is another essential factors. In order to capture the market share and attract customers, heavy promotion activities, advertisements and and marketing are obbligato and are main ways to compete with the established ones.

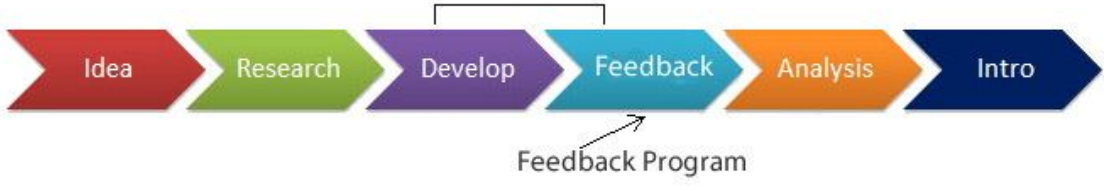
60% of the current potato chips market is occupied by Lay's, Super Crisp, Golden Crisps, Smith, Kolson and Krincles. The remaining 40% is owned by the un-branded potato chips, and this share can only be captured through aggressive marketing campaign. Heavy budget is needed to enter into the market.

Following are the key success factors:

- Select the good raw material as only best quality material can the producer produce high quality potato chips.
- Reduce waste production to save cost.
- Monitor the whole production process carefully and technically with the best suitable technical parameters.
- Innovation on the taste by using a variety of flavours.
- Advance sale orders an ensure the success of the business.
- Estimate the material, potatoes, requirement for the year and contract for it in advance with the suppliers to avoid the fluctuation in prices of the potatoes.
- Maintain the good quality to gain the brand loyalty of the customers
- Strength the cost accounting system so as to monitor the whole process fluently.

4.3 Practical Tips

Before production, some factors also are needed to research. The most important factor in successful new product introduction is a good match between the product and market needs -- as the marketing concept would predict. Developing new products goes through many stages before going to the market.



- The roadmap of the future market
- Generation of ideas coming from customers, distributors, competitors, research and development
- Business analysis
- Research of competition and market to determine future profitability
- Development after the product performance and safety
- Introduce to test market to evaluate consumers response.
- Commercialization
- New product enter the market

5. Project Profile

5.1 Opportunity Rationale

With the invasion of satellite and the development of globalization, people in Pakistan have been influenced by the western eating habits, especially the youngsters who tend to emulate those of the west and consider it as a fashion. Currently, people tend to consume the western snacks and the consumption is on rise. Therefore, the potato chips market is also increasing at a high speed.

Before the launch of Lay's, the Pakistan snacks food market is represented by biscuits, corn-based and non-potato snacks. With the improvement of people's life standard, premium quality and internationally recognized potato chips is needed. With the launch of Lay's, high quality potato chips appear on the Pakistani snacks scenario. As a very few local potato chips manufactures in the market that consumers are aware of and a single international producer-Lay's, a new player has a great chance to enter the market through a heavy campaign and promotion activities.

5.2 The Project Brief

The project describes starting a potato chips manufacturing industry in any big city of Pakistan. The plant will produce high quality potato chips with a variety of flavour and good tastes that customers prefer to.

For the proposed business legal status, it can either be sole proprietorship or partnership. It depends on the investor. This pre-feasibility assumes the legal status to be sole proprietorship.

5.3 Project Capacity and Rationale

The capacity selection is a critical matter that should be decided through market research. In this pre-feasibility study, the capacity is 150 per hour of potato chips, which is the minimum viable size for potato chips manufacturing industry.

5.4 Project Investment

Total initial cost of the project is estimated as follows:

	Rupees
Capital Investment	36,886,430
Working Capital	26,650,806
Total Investment	63,537,236

The financing of the initial stage is as follows:

	Percentage	Rupees
Debt	50	31,768,618
Equity	50	31,768,618
Total Investment	100	63,537,236

Returns Period is as follows:

IRR	45%
NPV @ 20%	Rs. 211,063,976
Pay Back Period	4.18 years

5.5 Location

Integrated all aspects of the market and economy development, the proposed industry can be set up in any industrial area of a big city like Lahore, Karachi or Islamabad, where raw material is easily available and infrastructure is existed. In this pre-feasibility, this project is suggested to be located at Karachi.

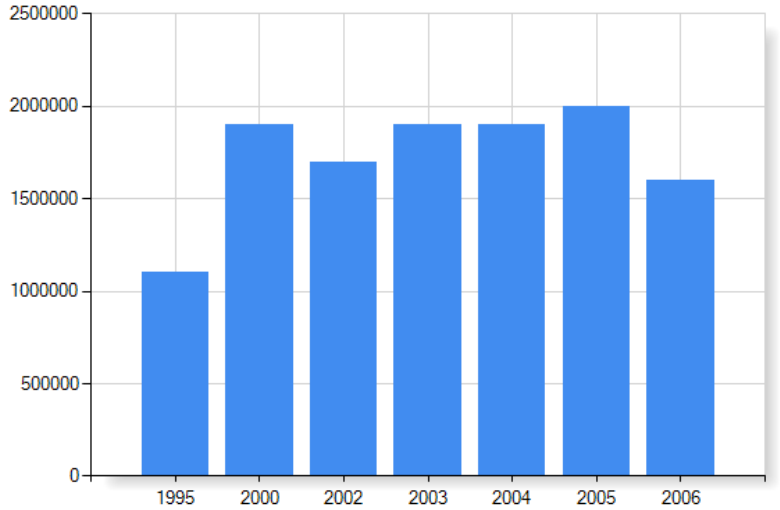
6. The Market of Potatoes of Pakistan

Due to its favourable climate, Pakistan potatoes production is quite generous. Pakistan is one of the largest potato producing countries. However, Pakistan as one developing country is lack of storage and processing facilities, which leads to lots of potatoes wasted and the products being in poor quality. Lack of storage facilities also lead to fluctuation in price during the off-season.

6.1 Pakistan Potato Production

Potato as a cash crop is grown in Pakistan on about 145,000 hectares distributed over eight different agro-ecological zones. About 70 to 80 percent of the production is concentrated in the irrigated plains of the central Punjab and Southeast North West Frontier Province. There are three seasons of potato cultivation, i.e.autumn, spring and summer.

Pakistan Potato Production



The potato harvest seasons and the production volumes which differ from crop to crop are as follows:

Season	Production
November-March (Autumn Crop)	-- (Punjab & NWFP plains)
Jan-Feb (peak harvest)	85% of the national potato production
April-May (Summer Crop)	5% (Punjab & NWFP plains)
July-September (High hills)	5% (Northern Areas)
September- October (High hills)	5% (NWFP & Balochistan)

The above chart indicates that bulk of the potato crop is harvested from January to March. And the off-season is November to March. This results the fluctuation in prices. The market prices during January to March are lower than the remaining months. This encourages exports which too are mostly made from the autumn crop.

6.2 Pakistan potato Exports

The potential export market for snacks existed in the Middle East, Gulf countries and Central Asian States which has not been explored, for example, Afghan and China. For the next decade, the export prospects are very bright. Besides that, tariff cuts under Trade Agreements are anticipated, which will increase the benefits in exports.

Pakistan total export of potatoes in 2007 was $34.5 million and in 2008 was $20.6 million. Sri Lanka was the major importing country of potato with the share of 56.4% in Pakistan total potato export in 2008. Iran was the second major country and the share was 17.1%. Malaysia was the third. Pakistan also exporting potatoes to Afghanistan, U.A.E, Iraq, Singapore, Oman etc.

7. Market Information about Potato Chips

7.1 The Current Potato Chips Market

With the advent of globalization and adoption of the western culture, potato chips have become a major part of the snacks industry. The current potato chips market is owned by a few local potato chips brand and a single international brand-Lay's.

Lay's, Super Crisps, Golden Chips, Smiths, Kolson and Krincles lead the potato chips market and own 60% of the potato chips market. The remaining market share is owned by local unbranded potato chips.

7.2 Market Research & Trend & Analysis

With the improvement of life standard and the advent of globalization, demand for high quality and international quality snacks is growing. People pay more attention on health issues and require healthier snack. However, only few industries, such as Lay's, can meet this demand. This give a potential market for the new player to enter. The new player can gain the remain market share through produce high quality potato chips and heavy promotion campaign and advertisements.

8. Pakistan Snacks Industry

Pakistan, being an "impressive great country" for foreign investors from the multinational companies (MNCs) like PepsiCo International, still has great potential

in snacks market, especially potato chips market in nowadays.

In 2009 the global savory snacks market was worth $74.7bn. This growth is observed in emerging markets. The market is set to grow in value by $10.8bn to $85.4bn by 2012 . The market for savory snacks in Pakistan increased at a compound annual growth rate of 7.4% between 2004 and 2009. The potato chips category led the savory snacks market in Pakistan, accounting for a share of 48.1%, which came from the changing in life styles and traditional eating habits.

8.1 Demand and Supply

According to the survey carried out by SMEDA, the market segment with respect to age is as follows. It indicates that 65% consumers are in the age group of 5 to20 years old as they are influenced with the media advertisement. This group may become loyal to brand.

Market Segmentation

Age Group (Years)	% Share
5-10	30
11-12	35
21-35	20
36-above	15

Based on market research, about 60% of the customers are brand loyal and the remaining is unbranded loyal which can gain through heavy promotion activities and advertisement campaign.

Segmentation--Snacks Industry

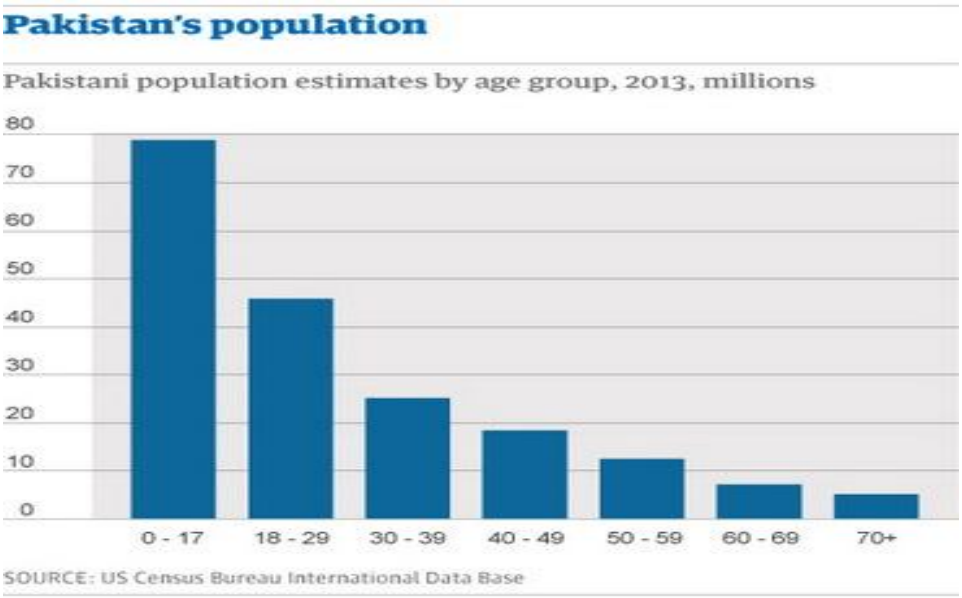
Segments	% Share
Branded	60
Unbranded	40
Total	100

8.2 Target Customers

The target market of potato chips are children, teenagers and youngsters. 70% of children eat snacks at school and potato chips are their first choice as they are easy to carry and have unique and delicious tastes.

By the method of market segmentation, one of the major target market is children and young audiences of sports and entertainments such as consumers in theaters or stadiums even at home.

During school, children prefer to choose their own snacks, 70% select crisps and snacks compared to luchbox, which mother generally pack for them. About 44% of the consumers prefer to buy children's snacks in multi packs while nearly half of all consumers are price motivated in their snack purchasing.



9. Production Process

9.1 Production Equipment

To start a potato chips manufacturing industry, the processing line should be equipped with the following machines, which are highly automatic and can produce premium quality potato chips.

- Washing & Peeling Machine - For washing and peeling fresh potatoes.
- Potato Chips Machine - For slicing potatoes into chips or slices. Potato Chips
- Blanching Machine - For pre-cook the chips.
- Potato Chips Dehydration Machine - For drain the water on the surface of chips. Potato Chips Frying Machine - For frying the chips.
- Potato Chips De-oiling Machine - For drain the oil on the surface of chips.
- Potato Chips Seasoning Machine - For flavouring the potato chips in different tastes.
- Nitrogen Filled Potato Chips Packaging Machine - For packaging the chips.

9.2 Production Process Flow

The technological process flow is as follow:

- Material Selection: Select fresh potatoes of high dry matter content, pure varieties, light eyes,regular shape, free from mildew rot, sprouting and insect infestations and other phenomena, 50~70mm in diameter.
- Washing and Peeling: Use potato washing and peeling machine to remove the dirt, sand and other debris. Feed 30~40kg each time, the peeling time is determined by the degree of freshness of material, usually 3~8min.Peeling time should not be too long or the potatoes will be excessive peeled.
- Potato Slicing: Feed the material into the potato chips machine, feeding at a constant speed, the thickness should be 1~2mm.
- Blanching: Use potato chips blanching machine. The potato slices should be immersed into water to blanch, in order to prevent browning in the air, and wash

away the free starch of the surface to avoid the starch dissolving into the oil and shorten the life of frying oil.

- Potato Chips De-watering: Use potato chips dehydration machine. Remove surface water, to avoid increasing the frying time and increase the oil content of the final product.
- Potato Chips Frying: Use potato chips frying machine. The potato slices should be put into the oil at a constant speed. The oil temperature should be at 180~200℃. The chips should pass the frying pan in 2min. Palm oil is usually used in this process.
- Potato Chips De-oiling: Use potato chips de-oiling machine. After frying, use the de-oiling machine to remove the oil of the surface, and it can extent the shelf life of the product.
- Potato Chips Flavoring: Use potato chips seasoning machine. After flavored by seasoning machine, different flavor of potato chips are made.
- Weighing and Packaging: Use Nitrogen Filled Potato Chips Packaging Machine. The product needs quantitative packaging, net content error <±10%. To extend the shelf life, it need the use of aluminum-plastic composite bag vacuum nitrogen packaging.

10. Land and Building Requirement

10.1 Land

Total land required is about 20,600 Sq. ft or 5 kanals. The land price per kanal is calculated at Rs 1.0 million. The total cost of purchasing the land is estimated at Rs 5.0 million which may be different from location to location and city to city.

10.2 Building

The break up of the area requirement is as follows:

Building & Civil Works	Space Reqd. (Sq.ft)	Cost/Sq.ft (Rs.)	Total Cost (Rs.)
Plant Area	4,000	900	3,600,000
Generator Area	600	400	240,000
Air Compressor Room	600	400	240,000
Management Office	500	1200	600,000
Accessories Store	600	500	300,000
Potato Store	750	500	375,000
Finished Goods Store	1,000	500	500,000
Toilets	600	500	300,000
Grounds	9,000	60	540,000
Water Tank	--	--	400,000
Total Space Requirement (Sq. ft)	**20,600**		**7,635,000**
Boundary Wall	6,000	150	900,000
Total Infrastructure Cost			**8,535,000**

11. Human Resource Requirement

The total number of the employees is 65, including:

- Chief executive officer -- 1
- Administrative staffs -- 14
- Marketing staffs -- 13
- Production staffs -- 37

12. Conclusion

Market research and analysis shows Pakistan has a great potential market of potato chips for a new producer to enter. With the increase of population and the influence of western eating habits, the demand of premium quality and international quality potato chips is increasing, yet only a few industries and a single multinational corporation can meet the requirement. Therefore, new producer which can produce high quality potato chips is badly in need.