potatochipsmanufactury

Pre-Feasibility Study

POTATO CHIPS MANUFACTURING INDUSTRY INVESTMENT IN TANZANIA

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1. Executive Summary

The project refers to set up a potato chips manufacturing unit in the north of Tanzania. The plant will produce premium quality potato chips to be sold in the local market, competing with few existing branding. The plant will be using modern automated machinery for all the processes, ensuring quality check through out the production process. After processing done, the potato chips are packed in bags with the Nitrogen filled potato chips packaging machine.

The opportunity of the snack food business is in great potential as there are few producers in scale existed in Tanzania but a few retailers and street outlets. During these days, the snack food market it is represented by biscuits and corn-based products, corn cobs and still has a market vacancy. Recently, potato chips have appeared on the snacks market and have a trend to increase. Over the past few years in Tanzania the demand for snacks in general and potato chips has been on the rise, causing a gap between demand and supply. An opportunity is opened up to set up plants to produce high quality of potato chips at optimum production level.

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

2. Introduction

All over the world, the markets for fresh and processed potatoes is quite obvious. In many industrial cities, the important source of new growth in demand is from the processed potato market, especially potato chips. Potatoes are mostly eaten in processed form, with the largest volume as chips. With the reports of Global AgriSystem, the world trade of potato fries is amounted to 2.5 million MT for 2000. According the report, Netherlands, Canada, USA, India and China are the major producers contributing 90% of the trade. In contrast, most potatoes in Tanzania are sold fresh and unprocessed. However, there is considerable potential to expand the consumption of processed potato products in Tanzania. Potato is widely produced in Tanzania, ensuring a potentially supply.

This document is in the continuation of this effort to enable potential investors to make well-informed investment decision.

3. Purpose of the Document

The objective of this pre-feasibility study is mainly to facility potential entrepreneurs to make an investment in Tanzania to set up a potato chips manufacturing industry. The basis of investment environment and the information of the market is composed in the pre-feasibility study, in order to serve this objective. The document covers aspects of project concept development, start-up, and production, marketing. In the document, sectoral information and international scenario is provided, which have some effect on the project itself.

The purpose of this document is to facility potential investors in potato chips manufacturing by proving them a macro and micro view of snacks food market of

Tanzania with a hope that the information provided in this pre-feasibility study will help the potential investors in important investment decisions.

4. Crucial Factors & Steps in Decision Making for Investment

Below are some important factors and variables that have a great influence on setting up a potato chips manufacturing industry:

4.1 SWOT Analysis

It is quite important to analyze the associated risk factors, including strength, weakness, opportunity, and threat, when one is making the decision to invest in a potato chips manufacturing unit. A SWOT analysis can help in analyzing there factors, which play an important role in making the decision.

STRENGTH

- Continuous availability of raw material, fresh potatoes
- High automatic industry, helping reducing material waste and less labor force
- Easy availability of relatively cheap labor.
- Promising demand for domestically processed frozen chips.
- Favorable government policies for investment and importations in the ECA countries
- Urbanization, the proliferation of fast-food restaurants, growing tourism, and a significant change in eating habits among both high- and low-income groups in urban areas is raising the demand of potato chips
- Low transaction cost which will lead the prices of chips lower thant imported ones

WEAKNESS

- Inexperienced technical staff when compared with the existed potato chips industries in operation
- Changes in eating habits and lifestyle of Tanzanians
- The expected loss at the beginning period of the operation
- Labor efficiency and material waste at the initial time

OPPORTUNITY

- Market vacancy of the potato chips as there are few potato chips manufacturing industries in scale, except Bright Choice Company
- A large amount of consumers who are not brand loyal can be targeted through heavy marketing campaign.
- High quality and more healthful potato chips are needed as people pay more attention on health

THREATS

- Fluctuation in the price of fresh potatoes due to lack of storage facilities as a result of which large amount of potatoes is wasted
- Already established Multinationals currently have market shares of potato chips manufacturing.
- The quality supervision of potato chips is very strict nowadays
- Increasing level of poverty with the low saving and low holding capacity of general public increase

4.2 Key Success Factors

For the proposed project, among the key success factors for the proposed project, to control and carefully monitor the entire production process as it involves high waste production.

The marketing and promotion of potato chips in the local is bearing on a lot as well as foreign market in this pre-feasibility study. This concludes allocating a heavy budget towards promotional activities.

The current potato chips market belongs to retailers, hotels, restaurants, and homemade. As there is lack of cold storage facilities and finance support, no big industries exists in Tanzania. There is a big potential for potato chips in Tanzania. Therefore, to captured the market share remained, heavy investment towards marketing and advertisement is needed.

Key success factors will be:

- Select the best quality potatoes in order to produce high quality potato chips.
- Reduce waste production
- Monitor the process carefully
- Use the right equipment in order to reduce material waste, cost and labor force.
- Advance sale orders can guide the production and give a finance support
- Estimate the potato requirements for the year and contract with the suppliers so as to secure from the drastic changes in the prices of potatoes.
- Quality maintenance will play an important role as it is evident from the behaviour of the general consumers that they are more specific towards health issues than ever before.
- Strengthen the cost accounting system so as to monitor the whole process and determine the reasons for major variances in the process.

5. Project Profile

5.1 Opportunity Rationale

With the development of globalization, the east Africa countries' eating habits are changing to emulate those of the West, which also concludes Tanzania. In recent years, the consumption of western foods in Tanzania and other ECA countries is on the rise. Owing to this, the potential market share of potato products is also increasing at a high speed.

For a long time, biscuits, corn-based and non-potato snacks (chipsi mayai, samosa, chapatis) represented the Tanzania snacks market. The business of high quality and internationally recognized potato chips is yet to appear on the Tanzania market. There are few local potato chips manufacturers in the market that the consumers are aware of as most potato chips are made by retailers, outlets, hotels and restaurants. The potato chips market is still in the growth stage and it give a chance for new brand to enter the market. A new high-quality brand can obtain considerable market share in the growing market, lying on their marketing strategy and product quality.

5.2 Project Brief

The project describes building up a potato chips manufacturing industry in any big city of Tanzania. The plant will produce a variety of flavored, high quality potato

chips in three standard packet sizes: 20gms, 50gms, and 120gms.

5.3 Proposed Business Legal Status

The business legal status of the proposed project can either be sole proprietorship or partnership which depends upon the investor. For this pre-feasibility study, the business legal status is assumed as Sole Proprietorship.

5.4 Project Capacity and Rationale

The project capacity is a critical factor. With amounts of market research, the production capacity of this pre-feasibility study is decided to be 150 kg per plant hour of finished potato chips. It is the minimum viable size for a potato chips manufacturing plant. Through the research, it indicates that huge demand of potato chips is in and outside Tanzania; therefore a sizeable production is required. Besides that, the proposed unit will be working in two shifts.

5.5 Project Investment

For the proposed project, the total initial cost is summed up as follows: the capital investment requirement is worked out as 611,182,600.86 TZS; the working capital requirement is worked out as 441,585,397.26 TZS; the total project investment requirement is summed up to 1,052,767,995.07 TZS.

The processed pre-feasibility is based on the assumption of 50% debt and 50% equity. However, this consumption of debt and equity can be changed according to the requirement of the investor.

Project Financing

	Percentage	TZS
Debt	50%	526,640,095.77
Equity	50%	526,640,095.77
Total Project Investment		1,053,280,192.86

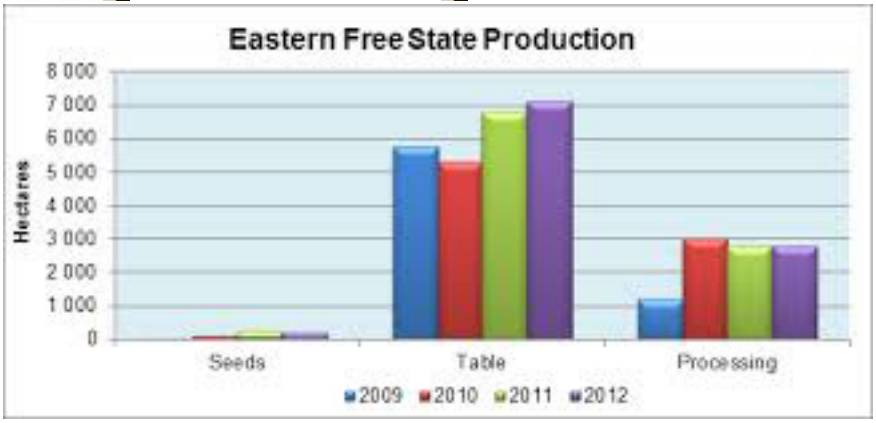
The internal rate of return is 45%. The net present value is 3,498,885,367.57TZS. The assumed pay back period is about 4.3 years.

5.6 Proposed Location

According the the pre-feasibility study, the project can be set up in any industrial area. It is recommended to establish the plant in an area where raw material is easily available, such as the north part of Tanzania. The suggested location for this proposed project is Arusha.

6. Market Information

Tanzania is is one of the largest potato producing countries in eastern Africa countries, yet it has very limited storage and processing facilities, as a result of that a substantial proportion of production is wasted. Due to inadequate storage and an less developed processing industry, prices fluctuates and not all of the excess production can be stored or processed for consumption during the off-season. The pr-feasibility here will indicate the current state of the potato production in Tanzania.



6.1 Tanzania Potato Production

Potato is an important food and cash crop in Tanzania and other eastern African countries. Potato production is growing faster than other major root crops and cereals. Yields are low due to shortage of appropriate varieties, chronic shortage of quality seed of the improved varieties, cultural practices, and poor access to market.

Most potatoes produced in the ECA region are consumed fresh, mainly boiled. With population doubling every 25 years and urbanization continuing to grow by 13% in the next 10 years, feeding habits are rapidly changing in favor of easy-to-prepare foods such as chips. There is good potential for the growth of processing industry and also good market access for both fresh and frozen potato chips in the region.

Tanzania produces potatoes not only for domestic but for exportation. Every year, Kenya will import lots of fresh potatoes from Tanzania. Therefore, processed potatoes can be great potential in this country as there are so many material supply.

Sample cities and towns representing production and consumption zones

Country	City/town representing potato consumption zone	City/town representing potato production zone
Tanzania	Dar Es Salaam	Arusha

6.2 Potato Whole-Sale Price Trends

Due to lack of adequate cold storage facilities, during the harvest time, huge supply of potatoes comes on the market, which drives the prices down. In the contrast, if storage devices are available, price fluctuation could be stabilized during the whole year.

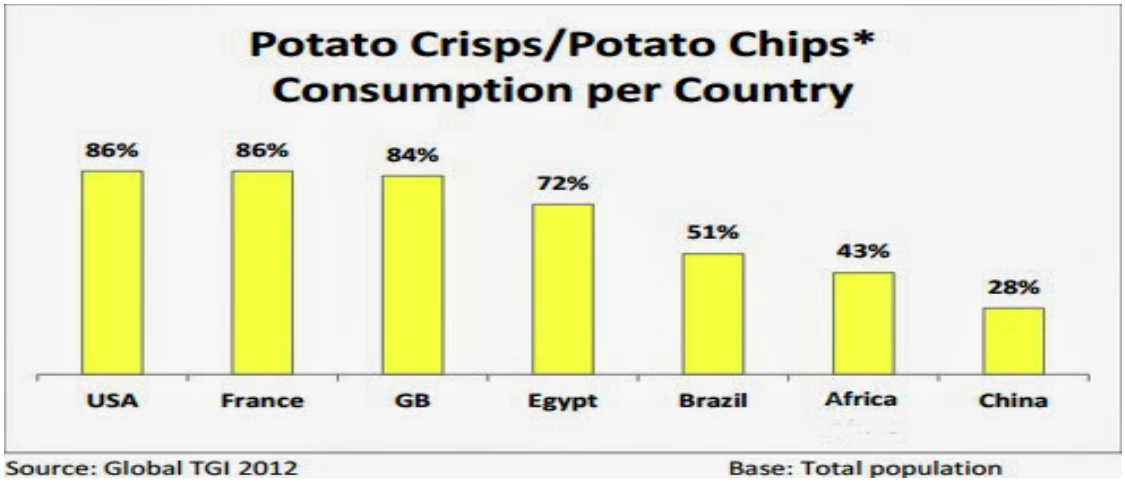
6.3 Africa Potato Exports

Reports have shown that potato sub-sector in Africa is expanding faster. For instance, during the period 1998-2004, estimates indicate that over 18 million metric tons of potato worth over USD 1.9 billion was produced in Burundi, D.R. Congo, Eritrea, Ethiopia, Kenya, Madagascar, Rwanda, Sudan, Tanzania and Uganda. Potao production has also expanded to non-traditional areas. Adoption of improved varieties has also significantly improved household food security and income. It was also reported that regionally released varieties are being used for processing instead of imported ones in a few cases, substituting for imports. For instance, the use of processing potato varieties, such as Asante and Tigoni in Kenya resulted in an aggregate annual net benefit of Ksh 10 million. These varieties covered approximately 10% of all the area under potato production in 2002. Farmer-based improved seed production was also found to be economically viable. For instance, in Uganda, mean

returns of 216% and 82% were obtained in 1998 and 1999, while in Kenya the use of Asante and Tigoni potato varieties increased farmers' returns by 22-53%. In Ethiopia, ownership of livestock and other animals has increased and overall living standards greatly improved from the incomes by 280% by using improved potato varieties as compared to the use of traditional varieties. This evidence implies a huge potential for expansion of the market for processed potato products, especially chips, in eastern and central African region.

FAO statistics of 2002 also indicate the fast growth of the potato Sub-Saharan Africa(SSA). The area under potato in SSA accounts for about 5% of the world potato area and it increased by about 250% in 2001 as compared to 1993. The area potato in the eastern and central African region accounts for 71% of the total area in SSA. The statistics also indicate that the rate of growth in area coverage of potato in SSA is faster than other crops such as wheat, rice, maize, sweet potato, cassava and yams. This is true partly because commercially-oriented farmers are responding to increased demand from the growing urban centers and subsistence-oriented farmers are responding to shrinking farm sizes. The revenue from potatoes is generally 10 times greater than that from grains. Policy makers have also noticed and believed that potato exports offer a potential source of foreign exchange. The findings also indicate that in most SSA countries potato is a highly commercial crop. Hence, to avoid the risks of commodity trade, policy makers seek value addition as part of trade through potao chips.

7. Market Information about Potato Chips



7.1 World Potato Chips Information

With the development of globalization and the the improvement of life standard, for many countries, the important sources of new growth in demand is from the processed potato market, especially chips also called 'French fries'. In industrial countries potatoes are mostly eaten in processed form, with the largest volume as chips. According to the reports of Global AgriSystem, total world trade of potato fries is estimated at 2.5 million MT for 2000/01. The report also indicated that Netherlands, Canada, and USA are the major players contributing more than 90% of the trade. India is also becoming a substantial market for frozen French fries. It was also noted

that the frozen French fries market in India is at a nascent stage with production in quality sector of over 3500 tons per annum, but it is growing at the rate of about 25% per year. The estimated domestic production of French fries in India is about 500 MT. It was reported that in 2500 US exports of frozen French fry only to mainland China was about 227,000 tons and to Greater China about 454,000 tons.

7.2 Market Research, Trend & Analysis

Tanzania's food consumption is changing significantly as lifestyles and traditional eating habits are changing. Retail sales of processed foods, especially potato chips, are expanding. As people pay more attention on the health issues, demand for international quality snacks is growing, particularly among educated, middle and upper income urban consumers due to changing lifestyles and change in the taste of the consumer, influence of foreign media and increasing awareness. Referring to other factors influencing the demand, there are the growing population, increase in income level and improved living standards. Advertising is also contributing to stimulate demand for potato snacks.

Price comparisons of domestically processed and imported chips in Tanzania

country	Locally processed chips (USD/kg)	Imported chips (USD/kg)	% increase
Tanzania	1.86	5.55	198

Following are some analysis on the factors that stimulate the demand of potato chips:

- Increasing urbanization and urban population

Urbanization and urban population are constantly increasing in Tanzania (**Urbanization: urban population:** 26.7% of total population **rate of urbanization:** 4.77% annual rate of change (2010-15 est.) (2011)). This leads to an increasing demand for food, including potato chips. The age groups below 30 in the urban population accounts for more than 70% of the population and for this category, the demand of potato chips is more than the old age category, which contributes the increasing demand for chips.

- Increasing tourism industry

Over the years, tourism industry is increasing . In Tanzania, with the development of globalization, the tourism industry grew by an estimated 10%, especially more than the global average of 5.5%. The increasing tourism industry expand the market of potato chips, and also leads an increasing of the demand for potato chips.

- Affordable prices of chips

Comparing with the import frozen French fries, chips processed in domestic are sold on the street and in shops in various packs can be sold for as low as less than half a dollar which is much lower than imported frozen fries. This is suitable for people of various income groups.

- Increasing incomes of urban households

In Tanzania, income of urban people is increasing at a high speed year by year. The increasing urbanization and tourism industry leads to the increasing income of urban households, which creates more demand for potato chips.

8. Tanzania & Snacks Industry

Globalization, population growth, urbanization, and increasing in income contributes the Tanzania snacks industry in an annual growth rate of 20%-30% per annum. With lots of market research, it indicates that children, teenagers and young people are the target customer of potato chips. The changing eating habits of the target customer and inclination towards western lifestyle contributes more towards having snacks for the target customers. In Tanzania, potato chips/crisps or French fries are labelled as a meal replacement, and are becoming more and more popular in people as a light fast food.

With the development of urbanization and improving of lifestyle, people have an increasing income which is another plus point for the investor. Also, tourism industry, globalization are also factors that can attract investors and boost the snacks market.

8.1 Demand and Supply

Through amounts of market research, the demand for potato chips is increasing in Tanzania and other eastern African countries and central African countries. 63% of the outlets in Tanzania said that the annual demand for chips is steadily increasing over the years. The demand in Tanzania is showing a net increment as evidenced by 47% of retail outlets.

The supply of potato chips has two channels in Tanzania, which is simple chips processing and not a developed industry.

- Retail outlets

Retail outlets cover mostly hotels, bars and restaurants, mobile box retails. The retail outlets process and prepare ready-to-eat chips themselves and sell to consumers directly.

- Imports of frozen chips

The second source of chips in Tanzania is imports. As five star hotels and some high income group need international standard and high quality potato chips, imports is the only way to sole it, though the import chips has a higher price than local chips.

Good potential exists for a new brand to compete and capture a market share provided the product has:

- Premium quality
- Unique packaging
- Customers' preferred tasted

For the industry, it should have:

- A wide distribution network
- Professional industry knowledge
- Financial support
- Market feedback system

8.2 Target Customers

Through market research, in Tanzania, youngsters, the middle income people, and the rich and the foreign tourists are target customers. The urbanization contributes an increasing income for urban people which improve their life standard and increase the demand for valued snacks. Recently, people pay more attention on their diet and

demand high quality potato crisp. With the development of globalization and the media, the western life style and taste have influenced the native a lot and have a big attraction towards them about the western things.

9. Production Process

9.1 Main Equipment

The potato chips manufacturing industry should b equipped with the following machinery:

- Washing & Peeling Machine - For washing and peeling fresh potatoes. Equipped with soft brush, potato washing and peeling machine can remove the thin peel completely and efficiently.
- Potato Chips Machine - For slicing potatoes into chips or slices. The potato chips machine can cut peeled potatoes into slices, chips and shredded potatoes. Rollers and cutters can be adjusted for potato slices and chips in different thickness.
- Potato Chips Blanching Machine - For pre-cook the chips. Potato chips blanching machine, is used to kill harmful bacteria and keep original flavor in food.
- Potato Chips Dehydration Machine - For drain the water on the surface of chips. Taking advantage of centrifugal dewatering methods, it can remove the surface water on blanched potato chips. Equipped with a shockproof device, this dehydration machine can stand steadily in high rotating speed.
- Potato Chips Frying Machine - For frying the chips.The device is characterized by high yield, stable operation, and can make the material completely submerged in oil to fry in a row. The fryer is equipped with oil filter device to ensure remove the oil residue timely and prolong the service life of oil. It also has a hydraulic device, which can make the whole transport framework raised or lowered in the fryer and is easy to clean and maintain. The fryer must have a good exhaust system, in order to eliminate evaporation of fat ingredient in time and prevent the reflux of bad odor and oil rancidity.
- Potato Chips De-oiling Machine - For drain the oil on the surface of chips. Similar to potato chips dewatering machine, this potato chips de-oiling machine adopts centrifugal principle to remove extra oil on fried potato chips and French fries.
- Potato Chips Seasoning Machine - For flavoring the chips. Potato chips and French fries can be added with various sauce for different taste.
- Nitrogen Filled Potato Chips Packaging Machine - For packaging the chips. Flavored potato chips need to be packaged quickly before going bad. Potato chips sealed in bags full of nitrogen would not react with oxygen. Packaged potato chips can reserve for a long time without any taste losses.

9.2 Technical Parameters of Automatic Potato Chips Plant

Material selection: select the fresh potatoes with shallow and less eyes, without mildew rot or germination and pests.

Washing and Peeling: Use the potato washing machine to wash in clean, cool water to remove all soil and peel potatoes to slices.

Slicing: Use the potato chips machine to slice corms about 3/64 inches thick. Rollers and cutters of the potato chips machine can be adjusted to slice corms in different thickness. Some taro chips processors put the slices into cool water to keep them from sticking together when cooking. If this option is chosen, dehydrate as much water as possible before cooking.

De-watering the chips: Use the potato chips dehydration machine. It can remove the water on taro chips. The de-watered taro chips can be fried easily in the frying process, which can reduce the frying time and reduce the cost and the energy consumption. ***Frying the chips:*** Use the potato chips frying machine. Heat oil to 260~320°F , and put the taro slices into oil. Then the temperature of the oil will drop at first, then return again. Remove the chips when the temperature reach to 300°F. It takes 2min. Use oil that do not affect the flavor of the chips, such as sunflower, safflower, cottonseed, peanut. Place the slices in hot oil to fry for 2min. During frying, keep the chips moving to avoid clumping. Master the time and temperature of the frying process suitably, as the frying process is essential to the water content and oil content of the taro chips and the color and luster.

De-oiling: Use potato chips de-oiling machine**.** Place hot chips on absorbent paper or a drip rack to drain off excess oil, or spin them lightly in a de-oiling machine. The potato chips de-oiling machine adopts the centrifugal principal to remove extra oil on the surface of taro chips. Eating too mach oil has no benefit on people's health, so de-oiling is quite important in producing high quality taro chips.

Flavoring: Use potato chips seasoning machine. Remove chips that are dark or have other defects. Salt or flavor the chips while they are still warm by flavoring machine. You can add various of sauce according to your preference.

Packing: You can use the nitrogen filled potato chips packing machine to pack the final taro chips. First, weigh cooled chips and put them into pre-labeled bags; then, double-check the weight. Thirdly, seal bags with pressure in a heat sealer (nitrogen flushing can increase the shelf life). Finally, place bags in box, and seal the box.

10. Land and Building Requirement & Human Resource Requirement

10.1 Land and Building Requirement

- Land Requirement

For building a potato chips industry, the total land required is approximately 20,600 Sq.ft.

- Utilities Requirement

Utilities requirement for a potato chips plant require electricity, gas, water and telephone.

- Building Requirement

The total space requirement of the building is 20,600Sq.ft. The total cost is USD 75 thousands.

10.2 Human Resource Requirement

- Chief executive officer

- Administrative staffs
- Marketing staffs
- Production staffs

11. Conclusion

In Tanzania, the most distinctly observable source of new growth in demand is from processed potato market in the form of chips. Yet commercial chips processing enterprises are not well established and in its infant stages in Tanzania. Therefore, there is a good potential for the developed potato chips manufacturing industry to capture the market.