



PROJECT PROFILE ON BOTANICAL PRODUCTS



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ADDIS ABEBA CITY ADMINISTRATION INVESTMENT COMMISSION
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PROJECT PROFILE ON BOTANICAL PRODUCTS

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I. Executive summary

This project profile is prepared to assess the viability of running ginger processing factory, in Addis Abeba city administration. Hence Market, Technical, Organizational and Financial study was made to investigate the viability of the envisaged project.

This project profile on ginger processing factory has been developed to support the decision –making process based on a cost benefit analysis of the actual project viability. This profile includes marketing study, production and financial analysis, which are utilized to assist the decision-makers when determining if the business concept is viable. Ethiopia has a private sector driven PVC ceiling factory. According to the latest data sourced from Ethiopian investment commission (EIC) there are more than 9 registered companies to invest on ginger processing and other related products. Out of them two are on operational stage, and two of them are on implementation stage and the remaining are on pre-implementation stage.

The location of the plant will be decided on the basis of access to raw materials, infrastructure namely power, water, transport and telecom to easy access to international market.

The factory at full capacity operation can manufacture 600,000 kg dried ginger per year based on 260 working days and two shifts of 16 hours per day.

The total investment capital including establishing the factory is Birr 160.10 million. Out of the total investment capital, the owners will cover Birr 48 million (30 %) while the remaining balances amounting to Birr 112 million (70 %) will be secured from bank in the form of term loan.

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As indicated in the financial study, the cash flow projection of the project shows surplus from the first year on. The net cash flows of the project range from Birr 31.49 Million in the first year to Birr 47.22 million at the end of the 10th year of operation. At the end of the 10th year of operation period the cumulative cash balance reaches Birr 464.47 million. The Benefit-cost ratio and Net present value (NPV) have been calculated at 17% discount factor (D.F) for 10 years of the project activity. Accordingly, the project has NPV of 270.68 million Birr at 17%D.F. and the benefit-cost ratio of 1.44 at 17% D.F.

Therefore, from the aforementioned overall market technical and financial analysis we can conclude that the Ginger processing factory business is a viable and worthwhile.

1. BACKGROUND INFORMATION

1.1 Introduction

This document was undertaken to show botanical products sector investment profile in Addis Ababa. In compiling the report, information from Addis Ababa investment commission, Addis Ababa trade and industry development, Ethiopian custom commission and published sources have been augmented.

The production of botanical products in Ethiopia is minimal compared to its raw materials availability in the country. One of the main causes of this disparity is absence of potential investor involved in the area.

The provision of adequate botanical product is of fundamental importance to Ethiopian's present and future demand of foods, food supplements, medicines, cosmetics, animal feed and veterinary medicines, medical devices, household products, etc. In Ethiopia, the demand for botanical product is expected to increase considerably in the next few decades as a result of increased population growth, urbanization and increasing income levels. This profile shows Ginger powder processing as an example of botanical products.

1.2 Product Description and Application

Today, ginger is used around the world as a dietary supplement and food ingredient. In addition to its culinary function, it has been used since ancient times for a variety of conditions, including colds, fevers, and digestive problems, and as an appetite stimulant. Ginger has been used for centuries to treat a variety of maladies, particularly in non-Western cultures. The strong aroma of ginger is the

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result of pungent ketones including gingerol, the extract that primarily has been used in research studies. The consumed portion of the ginger plant is the rhizome, often called “ginger root,” although it is not actually a root. The rhizome is the horizontal stem of the plant that sends out the roots.

The potential for value added products provides an extremely viable opportunity for sustainable promotion of rural as well as urban livelihoods. Processing of Ginger into value added products and selling to the markets directly/ tying up with big aggregators will help both the farmers and the consumers. Therefore, processing of Ginger into value added products such as Ginger powder can ensure nutritional and food security, improved profitability and also offers huge scope for entrepreneurship development at micro, small or medium scale levels.

Nowadays, individual spice farmers are flourishing at different corners of Ethiopia. Ginger and turmeric are becoming the main cash crops, next to coffee, for farmers in the South Western parts of the country.

The diverse agro- ecologies available in Ethiopia allows production of many spices, herbs and medicinal plants. Very useful exotic spice such as ginger is adapted to the hot humid lowland of Ethiopia and has been evaluated for yield and quality together with indigenous ones. Different agronomic/cultural practices and appropriate processing and drying procedures that well contribute to the various measures of quality have been developed through research. The country is currently growing endemic spices including ginger.

Ginger reduces cold and flu. It is good for heart as it reduces cholesterol and lowers risk of having heart diseases and blood clots. Most importantly, it regulates blood sugar levels. Ginger consists of anti-inflammatory components and antioxidants that can cure inflammation. Ginger was very effective in blocking prostate cancer cells and their growth. The anti-inflammatory properties

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available in ginger helps in good brain functionality. Ginger root can improve cognitive function. Ginger helps in preventing indigestion. It protects the liver from harmful chemicals and also reduces the risks of liver from ageing, damaging and scarring. Ginger prevents the bone damage, severe joint pain and stiffness in the joints associated with osteoarthritis.

1.3 Production of Ginger in Ethiopia

Ginger cultivated in many places in Ethiopia. The Specific area in Ethiopia has identified as Bahir Dar, Dejen, Debere Markos, Kola Dega Damot, Metekel and Agew Mider, Gamo, Galeb and Hamer Bako, Gofa and Kulo Konta, Wabe, Dolo and Genale, Sidama and Arero Gimbi, Nekemte, Horo Guduru and Arjo and All regions of Ilubabuor and Jima Zone. Despite its uses and contribution to the livelihoods of smallholders and to economy of the country, there has been limited attempt to promote its production and marketing through improvement of pre and post -harvest handling of the crop.

Ginger is a commercially produced horticultural crop in SNNPS, Ethiopia. The producing areas in SNNPRS are said to be ginger belts in Ethiopia where much of the country's production and marketing activities are located. Even though these areas were known as major suppliers of ginger in the country, limited attention has been given to expand production for betterment of smallholder farmers engaged in production and marketing activities. Moreover, no efforts have been exerted to process the Ginger in large scale except some small scale business and household level trials.

1.4 Project Location and Justification

1.4.1 Location of Addis Ababa

Addis Ababa is the seat of the Ethiopian federal government. It is located on the central highlands of Ethiopia in the middle of Oromia Region. The absolute location is around the intersection point of 9°14'48''N latitude and 38°44'24''E longitudes. This is very near to the geographical center of the country. It is, therefore, equidistant to the peripheral areas or is equally accessible to almost all parts of Ethiopia. Addis Ababa is located on a well-watered plateau surrounded by hills and mountains. The city is in the highlands on the edge of the Ethiopian rift valley or the eastern slopes of the Entoto Mountain ranges bordering the Great Rift Valley. The total area of Addis Ababa is about 540 km² of which 18.2 km² are rural. Addis Ababa's built-up urban area spans 474 km². It is also the largest city in the world located in a landlocked country.

1.4.2 Demography of Addis Ababa

According to the CSA (2013) population projection, Ethiopia's total population reaches about 105 million people in 2022. Of the total population 22.9% (24 million people) live in urban areas. Ethiopia's urban population is expected to triple by 2037 (World Bank, 2015). Addis Ababa hosts an estimated 3,859,638 people. Currently, Addis Ababa is experiencing an annual growth rate of 3.8% and is estimated to reach 4,696,629 inhabitants by 2032 (CSA, 2015).

1.4.3 Economic activity of Addis Ababa

The transformation of Addis Ababa has especially been rapid since 1991. According to the data from the city's Bureau of Finance and Economic Development (2006), per capital income of Addis Ababa has grown from USD 788.48 in 2010 to USD 1,359 in 2015. The city also achieved a decline in the

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poverty index from a high of 29.6 in 2012 to 22.0 in 2014. Moreover, the current poverty headcount index for Addis Ababa is estimated at 18.9 while the poverty severity account for 5 and 1.8 index points respectively. Even though, the poverty status of Addis Ababa has an improvement over previous years, there is still much work to be done to curb both the incidence and severity of poverty.

The major contributor to the economic growth of the city is the implementation of publicly financed mega urban projects like condominium housing, the Light Rail Transit, the international airport and industrial zone development (The state of Addis Ababa, 2017). The existence of international large and medium-size enterprises in and around Addis Ababa have also significant role in creating huge opportunity for employment and technology transfer. Furthermore, there are strong demand for goods and services following the existence of many embassies and inter-governmental organizations like the African Union, the United Nations Economic Commission for Africa.

The manufacturing sector's contribution to Addis Ababa's GDP is high. Despite the fact that 86% of the industries in the city are micro and small scale (cottage and handicrafts, and small-scale), the majority of the country's large and medium scale industries are found in the city. Noticeable increases are also registered currently in other aspects of industrial growth.

The service sector is both the largest contributor to the city's economy and the largest employer. It contributes to 76.4% of the city's GDP while industry's share makes up (almost all) the rest. This sector is dominated by three major sub-sectors: Transport and communication; Real estate, Renting and Business services; and Trade, Hotel and Restaurants. According to the state of Ethiopian Cities 2015 report, the service sector has also been responsible for more than 50% of the growth in the estimated annual growth of the city's GDP. Although 75% of employment in the city is also generated in the service sector, a large proportion of the employed work in low skill and low paying

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jobs as shop salespersons, petty and 'gullit' traders, sales workers in small shops, domestic helpers or doorkeepers and restaurant service workers.

Analysis of the economic structure of Addis Ababa reveals that the services sectors (63%) dominates with industry (36%) in second place indicating that these sectors account for almost all of the Addis Ababa's GDP (The State of Addis Ababa, 2017).

Addis Ababa has a great share in the economy of the country due to its attractiveness to businesses, companies, individuals and foreign direct investment. Overall primacy index of the city is 24.8 based on urban employment and unemployment survey (CSA 2015). According to the State of Addis Ababa 2017 report, the simultaneous high rates of economic growth and urbanization in Addis Ababa indicates a likely further rising dominance of the city in Ethiopia's economy as well as growing agglomeration of economic activities in and around the city.

1.5. Why is it beneficial to invest in Addis Ababa?

Addis Ababa is the largest and most economically significant city in the country. Ethiopia's urban population share is only 17 percent (as of 2012, World Bank 2015). The city is the only urban area in Ethiopia capable of delivering scale economies in terms of concentrated demand, specialization, diversity and depth of skills, innovation, and technology transfers. Thus, investors will be benefited in getting capable human power from the market.

The capital is the country's main industrial hub. The city dominates industrial capacity in almost all the braches of light manufacturing that Ethiopia prioritizes. As a result Addis Ababa completely dominates production in various subsectors. This can be taken as the political and social stability of the city.

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Overall, the city has a beautiful environment, favorable location, and strong industrial base. Its advantage as an economic powerhouse of the country and human resource center are the most attractive features for local and overseas investors.

Moreover, investors will be getting a comprehensive set of incentives for priority sectors. These include:

- Customs duty free privilege on capital goods and construction materials, and on spare parts whose value is not greater than 15% of the imported capital goods' total value.
- Investors have the right to redeem a refund of customs duty paid on inputs (raw materials and components) when buying capital goods or construction materials from local manufacturing industries.
- Income tax exemption of up to 6 years for manufacturing and agro-processing, and up to 9 years for agricultural investment.
- Additional 2-4 years income tax exemption for exporting investors located within industrial parks and 10-15 years exemption for industrial park developers.
- Loss Carry forward for half of the tax holiday period. Several export incentives, including Duty Draw-Back, Voucher, Bonded Factory, and Manufacturing Warehouse, and Export Credit Guarantee schemes.

1.5.1. The city benefit from the investment

The city will be benefited from investment. These are discussed below.

- Employment opportunity

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Investment is expected to provide direct and indirect employment. These range from unskilled casual workers, semi-skilled and skilled employees.

- Improving growth of the economy

Through the use of locally available materials and exporting products, the investment contributes towards growth of the economy by contributing to the growth of domestic product. These eventually attract taxes including VAT which will be payable to the government hence increasing government revenue while the cost of local materials will be payable directly to the producers. In addition, domestic products save foreign exchange and exports also bring money to the country.

2. Market analysis summary

The current drive and emphasis by the government on the diversification of the industrial base away from the other sector presents an opportunity for production industry to a valuable contribution towards achieving goal. Having undertaken a thorough and comprehensive research of the market we realized that there was a vast opportunity for domestic products. Aware of the fact operating in such a market is largely dependent on good networking; the promoter intends to establish networks and strategic relationships with various wholesalers and retailers to ensure a steady stream of orders. In so doing the owner intend to ensure that the products they produce are of extremely high quality and fully serve the customers purpose.

2.1 The Supply of Ginger Powder

2.1.1 Local Supply

The demand for ginger powder in Ethiopia is met through import and local production.

2.1.2 Export

As shown in table 2, export of ginger powder has been declining significantly from year to year. The yearly average level of export which was about 7,384.19 tons during the period 2012-2014 has increased to a yearly average of 2.13 tons during the period 2015 - 2018. In the recent two years (2020-2021) the yearly average level of import has reached to a level of 0.64 tons. The annual average export decline rate of the last 10 years was too much.

In terms of value, the country was on the average earning 180.95 million Birr during the period 2012-2014. The earning from exporting ginger powder has decreased to annual average of only Birr 60,151.82 and Birr 130,522.00 during the period 2015-2018 and during the recent two years (2020

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& 2021) respectively. The huge decrease for the supply of ginger powder is believed to be due to lack of quality of product that satisfies end users.

In estimating the current effective demand for ginger powder, it is considered as reasonable to assume that the present demand for the product would be at least the average of the exported quantity of the first three years i.e. year 2012 to 2014.

Table 1: Import of *ginger powder* from 2012 to 2021

Year	Quantity (Tons)	Value (Birr)
2012	25.573	135,181.18
2013	3.795	68,159.70
2014	1.572	5,243.07
2015	0.000	-
2016	0.300	18,194.93
2017	0.900	4,787.40
2018	0.000	-
2019	0.000	-
2020	1.185	253,431.00
2021	0.124	40,684.00

Sources: Ethiopian Revenue and customs Authority, compiled by consultant

Table 2: Export of *ginger powder* from 2012 to 2021

Year	Quantity (Tons)	Value (Birr)
2012	10,032.45	285,758,059.44
2013	11,416.35	236,009,850.20
2014	703.78	21,078,794.36
2015	7.20	184,235.99
2016	1.20	30,584.47
2017	0.04	14,359.83
2018	0.08	11,427.00
2019	0.33	51,424.00
2020	0.57	134,077.00
2021	0.71	126,967.00

Sources: Ethiopian Revenue and customs Authority, compiled by consultant

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2.2 Demand Projection

The increasing urbanization offers huge market for readily available ginger powder packaged attractively and merchandised in organized urban platforms such as departmental stores, malls, super markets. The producer may also enter into agreements for supplying to big players or retailers in their brand name or as private labels. The producer may also enter into agreements with other food processors, food additives manufacturers, nutraceutical companies, ayurvedic pharmaceutical companies as well as cosmetic companies for supplying them with ginger powder. Export market is a major avenue for ginger powder, provided good hygienic production and compliant attractive packaging are done. Further there are several e-commerce companies that sell good quality produce, which can be utilized. Demand for organic products are on an increase and if the product is a result of organic cultivation and processing.

The total demand projection worked based on the above assumptions are presented in table 2.

Table 2: Projected demand for ginger powder from 2023 to 2032

Year	ginger (tons)
2023	541
2024	595
2025	655
2026	720
2027	792
2028	871
2029	959
2030	1,054
2031	1,160
2032	1,276

The demand projection, executed in table 2 reveals that the demand for Phosphoric Acid will grow from 541tons in the year 2023 to 792tons and 1,276tons by the year 2027 and year 2032, respectively.

3. Production Technology and engineering

3.1 Technology

3.1.1 Post-harvest operations of Ginger

a) Washing & drying

Freshly harvested ginger rhizomes are thoroughly washed in water twice or thrice and shade dried for a day. Ginger should be scrubbed by hand or with a soft-bristled brush in clean water sanitized with 150 ppm hypochlorous acid. Care is required during cleaning to prevent bulb breakage, which increases decay and shrinkage. The ginger intended for long term storage should be washed immediately after harvest and then cured. Curing is done by drying the rhizomes in air at ambient temperature (22°C to 26°C or 71°F to 79°F) and 70% to 75% RH for several days to allow the skin to thicken.

b) Sorting and Grading

Ginger is then pre-graded in the field for any unmarketable, damaged or diseased rhizome. Damaged and injured bulbs should be removed. The remaining marketable bulbs should be sorted according to size and overall appearance. The ginger surface should be clean, bright yellow-brown and appear fresh. It should not be wilted or have any evidence of sprouting. Export quality ginger should be smooth and firm, with uniform shape and size, be free from insect damage and decay, and have a uniform peel colour typical of the variety. The internal flesh should be firm and uniformly cream or pale-yellow coloured, without any indication of darkening.

c) Pre-cooling & Storage

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Forced-air or room cooling to 12 to 14 °C (54 to 57 °F) should be used for pre-cooling. Mature ginger rhizomes can be stored at 12 to 14 °C (54 to 57 °F) with 85 to 90% RH for 60 to 90 days.

3.1.2 Processing of Ginger Powder

The cleaned and sorted ginger must be cured and dried for storing for a long period, about 6 months. This dried ginger can be powdered, sieved and packed for marketing as Ginger powder. The following steps are the unit operations involved in the production of ginger powder.

a) Cleaning and Washing

The fingers and mothers are separated and ginger washers are used to clean the ginger. Cleaning of harvested rhizomes should be necessary to remove debris, shoots and roots. Thorough cleaning of rhizome required immediately after harvest if ginger intended for export or for long-term storage. Killing of rhizome was being followed in traditional method, in which rhizomes were dipped in boiling water for 10 min. This method is useful in inactivation of enzymatic processes. In ginger washer water is sprayed from the top of the washer to remove the impurities.

b) Sorting

In this process all the damaged and injured rhizomes are separated and the rhizomes are separated based on size and shape. Clean, brown-yellow and bright colored ginger should be preferred. Ruptured or blot skin with bacterial or fungal infected rhizome are not recommended

c) Peeling

Peeling serves to remove the scaly epidermis and facilitate drying. Peeling of fully matured rhizomes is done by scrapping the outer skin with bamboo splits having pointed ends and this accelerates the drying process. Deep scraping with knives should be avoided to prevent the damage of oil bearing cells which are present just below the outer skin. Excessive peeling will result in the reduction of essential oil content of the dried produce. The peeled rhizomes are washed before drying.

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d) Slicing

The rhizomes may be sliced before drying to reduce the drying time and improve the quality of the final product (it is easier to achieve a lower final moisture content in small pieces of rhizome without spoiling the appearance of the product). The rhizomes are traditionally sliced by hand, but there are small machines available to carry out this process.

e) Bleaching

The scrapped fresh ginger is dipped in a slurry of slaked lime (1 kg of slaked lime/120 kg of water) followed by sun drying. As the water adhering to the rhizomes dry, the ginger is again dipped in the slurry. This process is repeated until the rhizomes become uniformly white in colour. Dry ginger can also be bleached by the similar process. Liming gives ginger a better appearance and less susceptibility to the attack of insect pests during storage and shipping.

f) Drying

The moisture content of fresh ginger at harvest is about 80-82 per cent which is brought down up to 10 per cent for its safe storage. The yield of dry ginger is about 19-25 per cent of fresh ginger depending on the variety and climatic zone. Generally, ginger is sun dried in a single layer in open yard or clean bamboo mats or on a concrete floor which takes about 8 to 10 days for complete drying (final moisture content of 10 %). The sun dried ginger is brown in colour with irregular wrinkled surface. Using a mechanical drier will result in a better colour and a higher quality product. Tray drier, cross flow air tunnels, solar driers and cabinet driers can be used. The optimum drying temperature is 60°C temperature higher than this result in a darker coloured product. Sliced ginger pieces take only 5-6 hours to dry when a hot air drier is used. Whole peeled ginger rhizomes take about 16-18 hours to dry in a mechanical drier. It is important to monitor the air flow and temperature during drying.

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g) Milling/ grinding

Grinding is one of the most common operations used to prepare Ginger powder for consumption and resale. The main aim of particular spice grinding is to obtain smaller particle sizes, with good product quality in terms of flavour and color. There are different ambient grinding mills and methods available for this process; such as hammer mill, attrition mill and pin mill.

h) Sieving & Packing

The powdered dry ginger should be sieved through a mesh size of 50 to 60. The ginger powder is packed in packaging materials that deal with the common deteriorating factors of Ginger powder such as hygroscopicity, loss of aroma/ flavour, discoloration, insect infestation and microbial contamination. For bulk packaging, Flexible Intermediate Bulk Containers (FIBCs) commonly known as Jumbo bags with capacity up to 1 Ton are prevalent. For institutional packages, materials such as laminated flexible pouches and plastic woven sacks are used. In case of retail packs, printed flexible pouches (pillow type, gusseted type, and stand-up pouches) and lined cartons are the most common forms, with materials such as Polyester/ metalized polyester/ LDPE, BOPP/ LDPE, BOPP/ metalized polyester/ LDPE, Polyester/ Al foil/ LDPE.

More recently, organic products are gaining prominence because of their harmful chemical free nature. When ginger powder can be made organic, it will attract huge demand. This implies that not only cultivation, but also the processing methods should also be based on mechanized, physical and biological processes to maintain the vital quality of organic ingredient throughout each step of its processing. Therefore, value addition of ginger has great potential in terms of maintaining the nutritive quality of the product, ginger powder, and minimizing post-harvest loses and enhancing the non-seasonal availability.

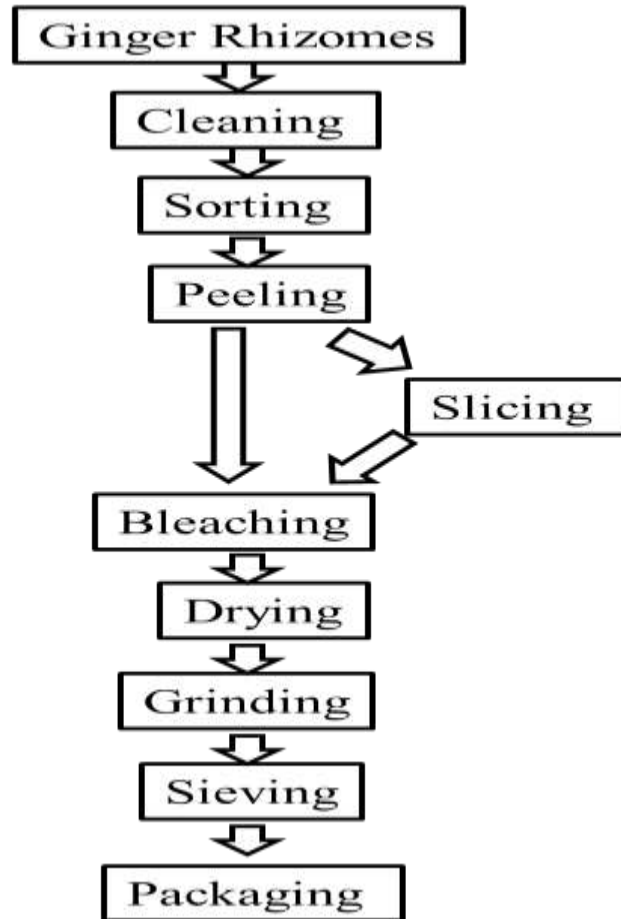


Fig: Manufacturing process of Ginger powder

3.1.2 Environmental and Social Impact Assessment

Typically, any developmental projects also trigger a set of environmental and social impacts. These environmental and social due to development projects occur in different forms. An Environmental and Social Impact Assessment (ESIA) has to be carried out to study the potential environmental and social impacts due to the production of Ginger powder. Potential environmental and social impacts due to the production of Ginger powder on attributes like air quality, noise, water quality, soil, flora, socio-economic, etc. have to be assessed as part of the ESIA study. Appropriate mitigation measures to help minimize/avoid impacts from the development have to be recommended in the study. The

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measures include avoidance measures, mitigation measures and environmental enhancement measures. Social responsibility cost estimated to be 1% of fixed investment costs.

3.1.3 Production capacity

The annual production program at full capacity will produce 600 tons per year. The plant initially produces 70 % of its annual rated capacity bound to initial operating problems such as machine set up and marketing. The production program does not include Sundays and national and public holidays. It was also considered that the plant would conduct annual maintenance for 12 days when the supply of raw materials is low.

Hence, based on the demand gap and the minimum economic of scale for Ginger powder production, a plant with a capacity of 600 ton of Ginger powder per annum is proposed

3.1.4 Production program

The production program of the envisaged plant is given in table 3.

Table 3: Ginger powder production program

Year of Production	1 st Year	2 nd Year	3 rd Year	4 th -10 th Year
Capacity utilization (%)	70	80	90	100
Ginger powder (Kg)	420,000	480,000	540,000	600,000

3.2 Engineering

3.2.1 Land, buildings and civil works

The required area (m²) and construction cost for the production facilities essential for the successful operation of the processing plant is shown in Table 4. A total area ready for the processing plant is 5,000m² out of which 4,480 m² is to be covered by building while uncovered area of 520m² is left storage of waste materials and future expansions. In order to estimate the land lease cost of the project profiles it is assumed that all the project will be located in different land level from level 1/1 to level 4/3, their current market lease price is from 39,073.31 birr per M² to 2,800.71 birr per M² respectively. Therefore, for the profile a land lease rate of birr 3,885 per M² have been taken, which is between the ranges.

The cost of construction of building should be appropriate to the size and expected profitability of business, costs of building generally differs by the type of construction materials used, the type of foundation, wall height and location. The current building cost for simple storage and processing room is from 10,000.00 Birr per m² to 25,000.00 Birr per m². The total construction cost of buildings and civil works, at a rate of Birr 20,000per m² is estimated at Birr 86.10 million. Therefore, the total cost of land lease and construction of buildings and civil works is estimated at Birr 105.52 million.

The proposed plant layout comprises the following buildings and structures.

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Table 4 Building costs

S/No	Descriptions	Total area in M ²	Estimated cost per square meter (in Birr)	Total estimated cost (in Birr)
1	Raw materials receiving and store	1,000	20,000.00	20,000,000.00
2	Production room	1,000	20,000.00	20,000,000.00
4	Filling and packing room	500	20,000.00	10,000,000.00
5	Packing materials store	500	20,000.00	10,000,000.00
6	Final products store	500	20,000.00	10,000,000.00
11	Power station room	20	20,000.00	400,000.00
12	Administration office	300	20,000.00	6,000,000.00
14	Toilet and shower for female	40	20,000.00	800,000.00
15	Room for cloth changing for female	40	20,000.00	800,000.00
16	Toilet and shower for male	40	20,000.00	800,000.00
17	Room for cloth changing for male	40	20,000.00	800,000.00
18	parking	500	5,000.00	2,500,000.00
19	For expansion	520		0.00
20	Fence			4,000,000.00
	TOTAL	4,480 M ²		86,100,000.00

PROJECT PROFILE ON BOTANICAL PRODUCTS

Table 5 Land lease period in Addis Abeba

Sector of development activity	Period of lease	Down payment
Education, health, culture and sports	90	10%
Industry (manufacturing)	70	10%
commerce	60	10%
For urban agriculture	15	10%
For others	60	10%

Sources: - city government of Addis Abeba land development and management bureau

Table 6 Land lease floor price in Addis Abeba

S/No	Land level	Current land lease floor price per M ²	Current lease price per M ² (Market price)
1	1/1	2,213.25	39,073.31
2	1/2	2,165.47	36,825.73
3	1/3	1,900.19	34,578.15
4	¼	1,552.93	31,119.21
5	1/5	1,531.91	29,096.45
6	2/1	1327.39	27,073.71
7	2/2	1,221.18	25,050.96
8	2/3	1,191.17	23,028.21
9	2/4	1,074.39	21,005.46
10	2/5	1,027.84	18,982.71
11	3/1	994.71	16,959.96
12	3/2	960.21	14,937.21
13	3/3	927.84	12,914.46
14	¾	904.77	10,891.71
15	3/5	873.74	8,868.96
16	4/1	814.06	6,846.21
17	4/2	786.45	4,823.46
18	4/3	748.80	2,800.71

Sources: - city government of Addis Abeba land development and management bureau

PROJECT PROFILE ON BOTANICAL PRODUCTS

3.2.2 Machinery and equipment

The total cost of machinery and equipment is estimated at about Birr 25 million. Lists of required machinery and equipment are shown in table 5.

Table 7: Lists of required machinery and equipment

S/N	Description	UOM	Number of Equipment	Unit Cost of Equipment(Birr)	Total Cost of the Equipment(Birr)
1	Weighing scale	pcs	1	1,500,000.00	1,500,000.00
2	Washer cum Peeler	“	1	2,500,000.00	2,500,000.00
3	Slicer	“	1	1,000,000.00	1,000,000.00
4	Dryer	“	1	12,000,000.00	12,000,000.00
5	Polisher	“	1	2,500,000.00	2,500,000.00
6	Grinder	“	1	1,500,000.00	1,500,000.00
7	Sieve	“	1	500,000.00	500,000.00
8	Packing machine	“	1	3,500,000.00	3,500,000.00
Total					25,000,000.00

3.2.3. Lists of machinery suppliers

ALIBABA

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Zhengzhou Taizy Machinery Co., Ltd

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WhatsApp/Tel/WeChat: +86 158 3819 2276

**Address: Nautical Road East, Zhengzhou Economic
Development Zone, Henan, China**

PROJECT PROFILE ON BOTANICAL PRODUCTS

4. Organizational structure

The selection of structure of the envisaged project is made based on the existing structure of manufacturing plants operating in the country, the capacity, complexity and technology mix of the plant. Organizational structure principles such as specialization, coordination, and departmentalization are also considered for design of structure that best suits the envisaged project

4.1 Manpower Requirement and Estimated Annual manpower costs

Description	Number	Monthly salary	Annual salary, Birr
plant manager	1	30,000.00	360,000.00
Administration and finance manager	1	15,000.00	180,000.00
Human resource manager	1	7,500.00	90,000.00
Secretary	1	5,000.00	60,000.00
Marketing and sales officer	1	10,000.00	120,000.00
Sales manager	1	15,000.00	180,000.00
Accountant	1	10,000.00	120,000.00
Production unit leader	1	15,000.00	180,000.00
Senior Mechanic	3	10,000.00	360,000.00
Senior Electrician	3	10,000.00	360,000.00
Purchaser	1	10,000.00	120,000.00
Operator	16	4,000.00	704,000.00
Ass. Operator	16	2,000.00	352,000.00
Store keeper	2	5,000.00	120,000.00
Quality manager	1	15,000.00	180,000.00
Microbiologist	1	10,000.00	120,000.00
Sugar dissolving team	1	6,000.00	72,000.00
Boiler technician	1	3,000.00	36,000.00
Guard	4	1,400.00	67,200.00
Driver	1	3,000.00	36,000.00
Cleaners	12	1,500.00	216,000.00
Sub total	70		4,033,200.00
Grand total			4,865,200.00

5. Financial Analysis

5.1 General

The financial analysis evaluation of ginger processing project, are mainly consisted of capital investment as well as operating and maintenance costs. The capital investment costs include fixed investment costs (initial fixed investment and replacement costs) and working capital, while operating and maintenance costs comprise current expenses related to material inputs, manpower cost, utility, repair and maintenance costs, spare parts, Overheads, Sales and distribution, interest and depreciation expenses.

The financial analysis and evaluation has been conducted taking assumptions:

1. It is assumed that about 70% of the total capital investment costs including the working capital requirement could be covered through development bank loans of short and long-term credits. The remaining balance 30% will be covered by equity capital contribution of the project owner.
2. Even though the project might secure loans under different term and conditions as well as from different financial sources, for the purpose of calculation of debt service scheduling, the current development bank of Ethiopia credit terms and conditions have been used. Consequently. It is assumed that the project will secure loan facility on the basis of 11.5 % annual interest rate.
3. Even though the estimated project production life is more 10 years, the financial analysis has been undertaken for a period interval covering the first 10 years only, during which time most of the capital assets are assumed to be depreciated, debts recovered and pay-back period accomplished.

PROJECT PROFILE ON BOTANICAL PRODUCTS

4. It is assumed that the project will be start up production activity at 70 % capacity. During years 2 & year 3 the projects is anticipated to gradually increase capacity utilization to reach 100% in year 4. Therefore, starting from year 4 the project will be operational at full capacity.
5. For the project under reference promotional, sales and distribution expenses have been estimated at 3% of the sales revenue.
6. Maintenance and spare parts costs are 1.5% of the fixed investment costs.
7. Furniture and fixture costs assumed to be 500,000.00

5.2 Initial Fixed investment costs

Table 8 Initial Fixed investment costs

S/No	Fixed investment type	Unit of measurement	Quantity	Unit price	Total Amount	Remarks
1	Land	Square meter	5,000	3,885 birr/M ²	19,425,000.00	The period of land lease will be 70 years and 10% of the total lease amount will be paid in the first year
2	Buildings and civil works	Square meter	4,480	lump sum	86,100,000.00	
	Sub total				105,525,000.00	
3	Machineries	set	2	Lump sum	25,000,000.00	
4	Transformer	set	1	Lump sum	2,000,000.00	
5	Weighbridge	Set	1	Lump sum	4,000,000.00	
6	Truck and vehicles	Pcs	2	Lump sum	6,000,000.00	
7	Furniture and fixture	Pcs			500,000.00	
	SUB TOTAL				37,500,000.00	
	Fixed capital investment costs				143,025,000.00	
8	pre-operational expenses				2,000,000.00	
	Working capital				15,083,000.00	
	TOTAL INVESTMENT COSTS				160,108,000.00	

PROJECT PROFILE ON BOTANICAL PRODUCTS

5.3. Working capital

Working capital is the financial means required for smooth operation and maintenance of a project mathematically, it is a difference between current assets and current liabilities. In the particular case of the project under consideration, the current assets comprise receivables, inventories (local and imported material inputs, spare parts, work in progress, and products ready for delivery) and cash in hand, while current liabilities comprise accounts payable to creditors.

5.4. Project Financing

Fixed capital investment costs and working capital requirements are assumed to be financed by equity capital of the owner and through loans of short and long-term credits. The company obtains loans under different terms and condition as well as from different sources, for the purpose of calculation of debt service scheduling the current development bank of Ethiopia credit terms and conditions have been used. Accordingly, it is assumed that the company will be able to obtain loan 70% of the total investment costs for construction of different buildings for purchase of machineries. The remaining balance that of the total investment costs will be expected to be covered by equity contribution of the project promoter.

5.5 Production costs

As it is depicted in Annex Table 15 major categories of the total production costs are assembled into the following cost elements.

5.5.1 Material inputs

The yield of dry ginger is about 19-25 per cent of fresh ginger depending on the variety and climatic zone. In the project under study the basic material inputs are fresh ginger and packing materials etc.

PROJECT PROFILE ON BOTANICAL PRODUCTS

Therefore, the current prevailing local and international market prices have been used for estimation of material inputs costs. At full capacity operation the material inputs costs are estimated at Birr 87.82 million per annum.

Table 9: Raw materials requirement and cost to produce 600,000kg of Ginger powder

S/No.	Description	Unit	Quantity	Unit costs	Total cost (in Birr)
1	Fresh Ginger	kg	2,727,273	30	81,818,190.00
2	Food grade Aluminum foil Packing material, for 1kg	Pcs	600,000	10	6,000,000.00
	Total				87,818,190.00

5.5.2 Utilities

In estimating costs of utility expenses for operation and maintenance of the project, Costs of fuel, oil and lubricant, electricity and water consumptions have been taken in to consideration, the rates of which have been estimated on the basis of the proposed capacity utilization program of the project and at the current official charging rates. At full capacity operation the project will have the following utility expense per annum which amounts to Birr 6.089 million.

PROJECT PROFILE ON BOTANICAL PRODUCTS

Table 10 Utilities of the factory'000''Birr

Utility''000''Birr		Start-up			Full Capacity
		70 %	80 %	90 %	100 %
Project year		1	2	3	4
Item description	Unit of measurement				
Fuel					
Gasoline for service vehicle	100km*260days*32Birr/LIT*8km/Li	104	104	104	104
Gasoline for transport truck	(200km*300days*32Birr/LIT*5km/Li)*3	1,152	1,152	1,152	1,152
Sub-Total		1,256	1,256	1,256	1,256
Change of oil and lubricant	10% of the fuel consumption	126	126	126	126
Sub-Total		1,382	1,382	1,382	1,382
Electricity	260days*24 hrs*650kwh* 1.00Birr/kwh	2,839	3,245	3,650	4,056
Sub- Total		2,839	3,245	3,650	4,056
Water	365days*100m ³ /day*15 Birr/m ³	384	438	493	548
Sub -Total		384	438	493	548
Telecommunication					
Telephone	5 lines* 1,500Birr/month/line+18Birr/line/month	31.08	31.08	31.08	31.08
Mobile	5 lines*1,500 Birr/month/line	30.00	30.00	30.00	30.00
Fax	2line*1,000Birr/month + 17 Birr/line/month	12.40	12.40	12.40	12.40
Internet	2,500 Birr/month	30.00	30.00	30.00	30.00
Sub-Total		103.48	103.48	103.48	103.48
TOTAL		<u>4,708.48</u>	<u>5,168.48</u>	<u>5,628.48</u>	<u>6,089.48</u>

5.5.3 Over heads

In the expenses under this title have been included land and building taxes, buildings, vehicles as well as machinery and equipment insurance, vehicles annual inspection; postage, telephone and e. mail, stationery and office supplies; printing and copying; audit fee; cash indemnity etc. The overhead costs and divided in to direct overheads and administration overheads.

PROJECT PROFILE ON BOTANICAL PRODUCTS

Table 11 Overhead costs

Direct Overhead”000”Birr		Year 1	Year 2	Year 3	Year 4
Annual land lease Payment		2,775	2,775	2,775	2,775
Insurance					
Building and Civil works	0.10%	115.30	115.30	115.30	115.30
Machinery and Equipment	0.20%	300	300	300	300
Motor vehicle and Truck	1%	60	60	60	60
Vehicles annual inspection and registration	25,000 Birr per annum per vehicle	50.00	50.00	50.00	50.00
Work cloth	Two times per annum per workers at 1,000 Birr	140	140	140	140
Cleaning and sanitation	An estimate of 300 Birr/day	78.00	78.00	78.00	78.00
Sub Total		3,518.30	3,518.30	3,518.30	3,518.30
Administration Overhead “000’ Birr					
Audit fee	40,000 Birr per annum	40.00	40.00	40.00	40.00
Office cleaning and sanitation	2,000 Birr per month	24.00	24.00	24.00	24.00
Stationery and office supplies	2,000 Birr per month	20.00	20.00	20.00	20.00
Printing and Copy	2,000 Birr per month	24.00	24.00	24.00	24.00
Sub Total		108.00	108.00	108.00	108.00
GRAND TOTAL		3,626.30	3,626.30	3,626.30	3,626.30

PROJECT PROFILE ON BOTANICAL PRODUCTS

5.5.4 Financial costs

As it has been outlined earlier under” project Financing” the current Development Bank of Ethiopia credit terms and conditions for newly establishing projects have been used to compute the financial costs, estimated to be incurred in connection with that of the total investment costs assumed to be covered through loan financing. The amount of the loan capital to be obtained and the financial costs to be incurred thereof have been determined depending on the amount of fixed investment cost and pre-production expenses.

5.5.5 Depreciation

Table 12 Depreciation in Birr"000"

Period			Start-up			
			70 %	80 %	90 %	100 %
Capacity utilization			70 %	80 %	90 %	100 %
Project year			1	2	3	4
Item description	Original Value					
Structure and civil works	86,100,000.00	5% of original value	4,305	4,305	4,305	4,305
Machinery and equipment	25,000,000.00	15 % of original value	3,750	3,750	3,750	3,750
Transformer	2,000,000.00	15 % of original value	300	300	300	300
Motor vehicles and trucks	6,000,000.00	15% of original value	900	900	900	900
Weighbridge	4,000,000.00	15 % of original value	600	600	600	600
Office equipment and furniture	500,000.00	20 % of original value	100	100	100	100
Pre-production expenses	2,000,000.00	25% of original value	500	500	500	500
Total			10,455	10,455	10,455	10,455

5.6 Break Even point and ROI

5.6.1 Break Even point (BEP)

Three kinds of break-even point

- A. BEP Sales Revenue(BR)
- B. BEP production (Volume)
- C. BEP Percentage (%)

A. Break-even point(BEP) Sales

To determine BEP Annual Sales, multiply annual sales found in income statement by the annual fixed cost, and divided by Annual sales less Annual variable cost.

$$\text{BEP (sales)} = \frac{\text{Annual sales} \times \text{Annual fixed costs}}{\text{Annual sales} - \text{Annual variables costs}}$$

Annual sales = 147,000,000 Birr

Unit selling price = 350 Birr/kg

$$\text{BEP (sales)} = \frac{\text{Annual sales} \times \text{Annual fixed costs}}{\text{Annual sales} - \text{Annual variables costs}} = \frac{72,737,000 \times 31,834,000}{147,000,000 - 72,737,000}$$

BEP (Sales) = 31,179,856 Birr

B. BEP production

To determine BEP production volume, divided BEP sales by the unit selling price (USP)

BEP production = 31,179.856/350 = 89,085

$$\begin{aligned} \text{c. BEP percentage} &= \frac{\text{Annual fixed costs} \times 100\%}{\text{Annual sales} - \text{Annual variables costs}} \\ &= \frac{31,834,0000 \times 100\%}{147,000,000 - 72,737,000} \\ &= 42.86\% \end{aligned}$$

5.6.2 Return on investment

Return on investment = Net profit /Total capital requirement

$$= 50,920,000/160,108,000$$

$$= 31.80\%$$

The return on owners' investment (ROOI)

= Annual net profit /owners' investment

$$= 50,920,000/48,032,400$$

$$= 106\%$$

5.7 Project benefits

For financial analysis and evaluation of the given project, the current raw Ginger price, and packing materials buying price and final packed processed Ginger price at the project gate has been taken as a basis. Consequently, based on the recent market survey, at the nearby market pints is estimated at Birr 30 birr per kg and delivery price of processed Ginger price has been indicated in table 15.

As it has been stated earlier the project is envisaged to reach full capacity operation four years after commencement of production activities which are assumed to begin with 70% of the estimated total capacity.

Thus, according to the computation in Annex Table 16 and Annex Table 18, the net income and cash flow statements analysis revealed that at full capacity operation the project will generate a total income (gross revenue) amounting to 210 million Birr per annum. The Net Income Statement shows a steady growth of gross profit starting from 42.43 million Birr in year 1 reaching the peak of 92.85 million Birr in year 10. In its 10 years of manufacturing activities, the project is expected to generate

PROJECT PROFILE ON BOTANICAL PRODUCTS

a total net profit of 494 billion Birr and contribute 266 million Birr to the government treasury in form of 35% income tax.

According to the current investment Law, machinery and equipment are anticipated to be imported duty- free. The liquidity position of the project is very strong. The corresponding Annex Table 18 of “Cash Flow Statement” shows the positive cumulative cash balance of Birr 464.50 million and the project will not face any cash shortage throughout its production life.

The computation of the pay-back period as depicted in Annex table 23 indicates that the project will be able to reimburse itself from its net cash-income within four years after commencement of production activities, the period which is considered to be very good for the project of this nature.

In Annex Table 24 of the Benefit-cost ratio and Net present value (NPV) have been calculated at 17% discount factor (D.F) for 10 years of the project activity. Accordingly, the project has NPV of 271 million Birr at 17%D.F. and the benefit-cost ratio of 1.44 at 17% D.F. These results are most appreciable, especially, when related to the external capital borrowing interest rate which ranges from 8.50% to 18.5 % for newly establishing projects.

Break-even point (BEP) have been undertaken the project under study when implemented will have BEP at about 42.86% operation of the estimated full capacity

In addition to this, finally, summary of financial efficiency tests have been conducted in Annex table 22, Accordingly, all efficiency ratios indicated positive trends and consequently, it can be inferred that the project can operate in the frame work of free market mechanism on commercially and financially viable basis and is remunerative.

ANNEXES

NNEX II

CALCULATION OF ANNUAL PRODUCTION COSTS

Table 13 Annual total production costs''000''

Period	Start-up			Full capacity						
	70 %	80 %	90 %	100 %	100 %					
Project Year	1	2	3	4	5	6	7	8	9	10
Cost category										
I. Material inputs including packing materials	61,473	70,254	79,036	87,818	87,818	87,818	87,818	87,818	87,818	87,818
II. Labor	4,865	4,865	4,865	4,865	4,865	4,865	4,865	4,865	4,865	4,865
III. Utility	4,709	5,169	5,629	6,090	6,090	6,090	6,090	6,090	6,090	6,090
IV. Repair and Maintenance and spare parts (0.5 % of fixed costs)	2,145	2,145	2,145	2,145	2,145	2,145	2,145	2,145	2,145	2,145
VI Direct overheads	3,518	3,518	3,518	3,518	3,518	3,518	3,518	3,518	3,518	3,518
A. Direct Production costs	76,710	85,951	95,193	104,436	104,436	104,436	104,436	104,436	104,436	104,436
VII. Administration over head	108	108	108	108	108	108	108	108	108	108
VIII. Marketing and Promotional expense 3 % of sales revenue	4,410	5,040	5,670	6,300	6,300	6,300	6,300	6,300	6,300	6,300
B. Operating costs	81,228	91,099	100,971	110,844	110,844	110,844	110,844	110,844	110,844	110,844
Interest	12,888	12,136	11,297	10,362	9,319	8,156	6,859	5,414	3,802	2,004
Depreciation	10,455	10,455	10,455	10,455	9,955	9,855	8,007	4,305	4,305	4,305
C. Total production costs	104,571	113,690	122,723	131,661	130,118	128,855	125,710	120,563	118,951	117,153

PROJECT PROFILE ON BOTANICAL PRODUCTS

ANNEX IV CALCULATION OF WORKING CAPITAL REQUIREMENTS

- I. Minimum requirement of current assets and liabilities
- A. Accounts receivable: 26 days at total production costs minus depreciation and interest
- B. Inventory
1. Material inputs: 26 days
 2. Spare parts : 90 days
 3. Work under process: two days at direct costs
 4. Product ready for delivery: 8 days at direct costs plus administration overheads
- C. Cash on hand : 360 days
- D. Accounts payable 26 days for material inputs and utilities

ii. Working capital requirement

Table 14 Calculation of working capital

Cost category	Minimum Days of coverage	Coeff-icent of turnover	Project year									
			Start up			Full capacity						
			1	2	3	4	5	6	7	8	9	10
I. Current asset												
A. A/R	26	10	8,123	9,110	10,097	11,084	11,084	11,084	11,084	11,084	11,084	11,084
B. Inventory												
1. Material inputs	26	10	6,147	7,025	7,904	8,782	8,782	8,782	8,782	8,782	8,782	8,782
2. Spare parts	90	4	536	536	536	536	536	536	536	536	536	536
3. Work under process	2	130	590	661	732	803	803	803	803	803	803	803
4. Product ready for delivery	8	32.5	2,468	2,753	3,037	3,321	3,321	3,321	3,321	3,321	3,321	3,321
C. Cash on hand	90	4	3,836	3,951	4,066	4,182	4,182	4,182	4,182	4,182	4,182	4,182
D. Current assets			21,701	24,037	26,372	28,709	28,709	28,709	28,709	28,709	28,709	28,709
II. Current liabilities												
A. A/p	26	10	6,618	7,542	8,467	9,391	9,391	9,391	9,391	9,391	9,391	9,391
III. Working capital												
A. Net working capital			15,083	16,494	17,906	19,318	19,318	19,318	19,318	19,318	19,318	19,318
B. Increasing in working capital			15,083	1,412	1,412	1,412	0	0	0	0	0	0

PROJECT PROFILE ON BOTANICAL PRODUCTS

ANNEX V

PROJECTED SALES REVENUE

Table 15 projected sales revenue

Period					Start up			Full capacity						
					70 %	80 %	90 %	100 %						
Capacity utilization		U/m	Quantity at full capacity	Unit price										
Item description	Product mix													
Project year					1	2	3	4	5	6	7	8	9	10
Packed ginger	Will be packed in 1kg	kg	600,000	350	147,000	168,000	189,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000
GRAND TOTAL					147,000	168,000	189,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000

PROJECT PROFILE ON BOTANICAL PRODUCTS

ANNEX VI

PROJECTED NET INCOME STATEMENT

Table 16 Projected Net income statement "000"

Period	Start up			Full capacity						
	70 %	80 %	90 %	100 %						
Project year	1	2	3	4	5	6	7	8	9	10
Item description										
Product sales revenue	147,000	168,000	189,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000
Less total production costs	104,571	113,690	122,723	131,661	130,118	128,855	125,710	120,563	118,951	117,153
Gross profit	42,429	54,310	66,277	78,339	79,882	81,145	84,290	89,437	91,049	92,847
Tax	14,850	19,009	23,197	27,419	27,959	28,401	29,502	31,303	31,867	32,496
Net profit	27,579	35,302	43,080	50,920	51,923	52,744	54,789	58,134	59,182	60,351
Accumulated undistributed profit	27,579	62,880	105,960	156,881	208,804	261,548	316,337	374,471	433,653	494,003

PROJECT PROFILE ON BOTANICAL PRODUCTS

ANNEX VII DEBT SERVICE SCHEDULE AND COMPUTATION PAYMENT OF EQUAL ANNUAL INSTALLMENTS

Table 17 Debt services schedule and computation

Item description	Project year									
	1	2	3	4	5	6	7	8	9	10
A. Investment and working capital										
1. Investment										
2. Increment working capital										
Total										
B. Loan receipts and balances										
1. Loan receipts	73,164,116	68,892,999	64,130,703	58,820,744	52,900,139	46,298,665	38,938,021	30,730,903	21,579,967	11,376,673
2. Outstanding balance at end of year										
a. First year loan	73,164,116	68,892,999	64,130,703	58,820,744	52,900,139	46,298,665	38,938,021	30,730,903	21,579,967	11,376,673
Total										
A. Debt service										
1. First year Loan										
a. Interest	8,413,873	7,922,695	7,375,031	6,764,386	6,083,516	5,324,347	4,477,872	3,534,054	2,481,696	1,308,317
b. Repayment of principal	0.00	4,271,117	4,762,295	5,309,959	5,920,605	6,601,474	7,360,644	8,207,118	9,150,936	10,203
Sub total										
Interest sub total										
Total										
Net financing										

PROJECT PROFILE ON BOTANICAL PRODUCTS

ANNEX VIII CASH-FLOW STATEMENT FOR FINANCIAL PLANING

Table 18 Projected Cash flow statement

Period	Start up			Full capacity						
	70%	80%	90%	100%						
Capacity utilization	70%	80%	90%	100%						
Project year	1	2	3	4	5	6	7	8	9	10
Item description										
A. Cash - inflow	313,726	170,336	191,337	212,336	210,000	210,000	210,000	210,000	210,000	210,000
1. Financial resource (total)	166,726	2,336	2,337	2,336						
2. Sales revenue	147,000	168,000	189,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000
B. Cash – outflow	282,235	131,875	145,936	160,030	158,234	158,676	159,777	161,579	162,143	162,771
1. Total assets schedule including replacement	166,726	2,336	2,337	2,336						
2. Operating costs	81,228	91,099	100,971	110,844	110,844	110,844	110,844	110,844	110,844	110,844
3. Debt service (total)										
a. Interest	12,888	12,136	11,297	10,362	9,319	8,156	6,859	5,414	3,802	2,004
b. Repayment	6,543	7,295	8,134	9,069	10,112	11,275	12,572	14,018	15,630	17,427
4. Tax	14,850	19,009	23,197	27,419	27,959	28,401	29,502	31,303	31,867	32,496
C. Surplus (Deficit)	31,491	38,461	45,401	52,306	51,766	51,324	50,223	48,421	47,857	47,229
D. Cumulative cash balance	31,491	69,952	115,353	167,659	219,425	270,749	320,972	369,393	417,250	464,479

PROJECT PROFILE ON BOTANICAL PRODUCTS

ANNEX XII TOTAL INVESTMENT COSTS

Table 19 Total investment costs”000”

Period	Start up			Full capacity							
	1	2	3	4	5	6	7	8	9	10	11
Project year											
Investment Category											
1. Fixed investment costs											
a. Initial fixed investment costs	143,025										
b. Replacement											
2. Pre-operational capital expenditure	2,000										
3. Working capital increase	15,083	1,412	1,412	1,412							
Total investment costs	160,108	1,412	1,412	1,412							

ANNEX XIII TOTAL ASSETS

Table 20 Total Assets

Period	Start up			Full capacity								
	1	2	3	4	5	6	7	8	9	10	11	12
Project year												
Investment Category												
1. Fixed investment costs												
c. Initial fixed investment costs	143,025											
❖ Cost of land												
d. Replacement												
2. Pre-operational capital expenditure	2,000											
3. Current assets increase	21,701	2,336	2,335	2,337								
Total assets	166,726	2,336	2,335	2,337								

PROJECT PROFILE ON BOTANICAL PRODUCTS

ANNEX XIV SOURCES OF FINANCE

Table 21 Sources of finance

Period	Start up			Full capacity							Total	
	1	2	3	4	5	6	7	8	9	10		
Project year												
Sources of finance												
1. Equity capital	48,032	1,412	1,412	1,412								
2. Loan capital	112,076											
3. Current liabilities	6,618	924	925	924								
Total finance	166,726	2,336	2,337	2,336								

ANNEX XI SUMMARY OF FINANCIAL EFFECIENCY TESTS

Table 22 Summary of financial efficiency tests

Project year	Project year									
	1	2	3	4	5	6	7	8	9	10
Capacity utilization	70%	80%	90%	100%						
Financial ratio in %										
1. Gross profit : Revenue	29%	32%	35%	37%	38%	39%	40%	43%	43%	44%
2. Net profit : Revenue	19%	21%	23%	24%	25%	25%	26%	28%	28%	29%
3. Net profit : initial investment	25%	31%	37%	44%	45%	45%	47%	50%	51%	52%
4. Net profit : Equity	57%	71%	85%	97%	99%	101%	105%	111%	113%	115%
5. Gross profit : Initial investment	38%	48%	58%	67%	69%	70%	72%	77%	78%	80%
6. Operating costs : Revenue	55%	54%	53%	53%	53%	53%	53%	53%	53%	53%

PROJECT PROFILE ON BOTANICAL PRODUCTS

ANNEX XV CALCULATIONS OF PAYBACK PERIOD

Table 23 Calculation of payback period”000”

Year	Amount Paid Back			Total investment	End of year
	Net Profit	Depreciation	Total		
1	27,579	10,455	38,034	160,108	-122,073
2	35,302	10,455	45,757	1,412	-77,728
3	43,080	10,455	53,535	1,412	-25,605
4	50,920	10,455	61,375	1,412	+34,358

PROJECT PROFILE ON BOTANICAL PRODUCTS

ANNEX XVI CALCULATIONS OF NET PRESENT VALUE AT 17% D.F.

Table 24 Calculation of NPV at 17% D.F.

Project year	Gross Revenue	1/(1+i) ⁿ At 17%	Present value at 17%	Project costs			
				Total investment	Operating costs	Total	Present value at 17%
1	147,000	0.854701	125,641	160,108	81,228	241,336	206,270
2	168,000	0.730514	122,726	1,412	91,099	92,511	67,581
3	189,000	0.624371	118,006	1,412	100,971	102,383	63,925
4	210,000	0.53365	112,067	1,412	110,844	112,256	59,905
5	210,000	0.456111	95,783		110,844	110,844	50,557
6	210,000	0.389839	81,866		110,844	110,844	43,211
7	210,000	0.333195	69,971		110,844	110,844	36,933
8	210,000	0.284782	59,804		110,844	110,844	31,566
9	210,000	0.243404	51,115		110,844	110,844	26,980
10	210,000	0.208037	43,688		110,844	110,844	23,060
Total			880,667				609,988

A. Benefit- cost ratio At 17% D.F. = 1.44

B. NPV At 17% D.F. = 270,679,000 Birr