



PROJECT PROFILE ON BISCUIT PRODUCTION



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ADDIS ABEBA CITY ADMINISTRATION INVESTMENT COMMISSION
ADDIS ABEBA

PROJECT PROFILE ON BISCUIT PRODUCTION

TABLE OF CONTENT

LIST OF TABLES.....	3
I. EXECUTIVE SUMMARY	4
1. BACKGROUND INFORMATION.....	6
1.1. INTRODUCTION	6
1.2. PRODUCT DESCRIPTION.....	7
1.3. PROJECT LOCATION AND JUSTIFICATION	7
1.3.1. Location of Addis Ababa.....	7
1.3.2. Demography of Addis Ababa.....	7
1.3.3. Economic activity of Addis Ababa.....	8
1.4. WHY IS IT BENEFICIAL TO INVEST IN ADDIS ABABA?	9
1.4.1. <i>The city benefit from the investment</i>	11
1.5. STATUS OF BISCUIT MANUFACTURING FACTORIES IN ETHIOPIA.....	11
2. MARKETING STUDY	12
2.1. MARKET ANALYSIS SUMMARY.....	12
2.2. THE SUPPLY OF BISCUIT.....	12
2.2.1. Local biscuit Supply	12
2.2.2. Import.....	13
2.3. BISCUIT DEMAND PROJECTION	14
2.4. DEMAND-SUPPLY GAP ANALYSIS.....	16
3. TECHNOLOGY AND ENGINEERING	17
3.1. TECHNOLOGY	17
3.1.1. Biscuit production process flow diagram	17
3.1.2. Environmental and social impact assessment of the project.....	22
3.1.3. Production Capacity and Production Program	22
3.2. ENGINEERING	24
3.2.1. Land, buildings and civil works.....	24
Sources: - city government of Addis Abeba land development and management bureau	26
3.2.2. Machinery and equipment.....	27
4. BISCUIT FACTORY ORGANIZATIONAL STRUCTURE.....	28
4.1. MANPOWER REQUIREMENT AND ESTIMATED ANNUAL MANPOWER COSTS	28
5. FINANCIAL ANALYSIS.....	29
5.1. GENERAL	29
5.2. INITIAL FIXED INVESTMENT COSTS.....	30
5.3. WORKING CAPITAL.....	31
5.4. PROJECT FINANCING	31
5.5. PRODUCTION COSTS	31
5.5.1. Material inputs.....	31

PROJECT PROFILE ON BISCUIT PRODUCTION

5.5.2.	Utilities.....	33
5.5.3.	Over heads.....	34
5.5.4.	Financial costs.....	35
5.5.5.	Depreciation.....	35
5.6.	BREAK EVEN POINT AND ROI.....	36
5.6.1.	Break Even point (BEP)	36
5.6.2.	Return on investment	37
5.7.	PROJECT BENEFITS	37

LIST OF TABLES

Table 1	Local supply of Biscuit in quintals.....	12
Table 2	Volume of imported sweet Biscuit from 2012 to 2021 in kg.....	13
Table 3	Future forecast of import of biscuit by trend adjusted exponential smoothing method.....	14
Table 4	Projected Demand for Wheat flour in Ethiopia.....	15
Table 5	Demand supply gap Analysis.....	16
Table 6	Production program in quantity.....	23
Table 7	Building costs.....	25
Table 8	Land lease period in Addis Abeba.....	26
Table 9	Land lease floor price in Addis Abeba.....	26
Table 10	Lists of Biscuit line machineries.....	27
Table 11	Annual manpower costs.....	28
Table 12	Initial Fixed investment costs.....	30
Table 13	Raw materials input plan in Birr'000'.....	32
Table 14	Utilities of the factory'000'Birr.....	33
Table 15	Overhead costs.....	34
Table 16	Depreciation in Birr"000".....	35
Table 17	Annual total production costs"000".....	40
Table 18	Calculation of working capital.....	41
Table 19	projected sales revenue"000".....	42
Table 20	Projected Net income statement "000".....	43
Table 21	Debt services schedule and computation.....	44
Table 22	Projected Cash flow statement.....	45
Table 23	Total investment costs"000".....	46
Table 24	Total Assets.....	46
Table 25	Sources of finance.....	47
Table 26	Summary of financial efficiency tests.....	47
Table 27	Calculation of payback period"000".....	48
Table 28	Calculation of NPV at 17% D.F.....	49

PROJECT PROFILE ON BISCUIT PRODUCTION

I. Executive summary

This project profile is prepared to assess the viability of running Biscuit 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 Biscuit 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 Wheat flour industry. According to the latest data sourced from Ethiopian investment commission (EIC) there are more about 113 companies registered to involve in production of biscuit and related products. The status of these companies is: 74% on pre-implementation, 10% on implementation and 16% on operation stages.

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 most locally available raw materials for the factory are wheat flour and other chemicals.

The factory at full capacity operation can produce 2,812,500 cartons, per year based on 260 working days and their shifts of 24 hours per day.

The total investment capital including establishing the factory is Birr 279.2 million. Out of the total investment capital, the owners will cover Birr 83.80 million (30 %) while the remaining balances amounting to Birr 195.44million (70 %) will be secured from bank in the form of term loan.

PROJECT PROFILE ON BISCUIT PRODUCTION

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 45.90 Million in the first year to Birr 64.40 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 671million. 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 369.55 million Birr at 17%D.F. and the benefit-cost ratio of 1.14 at 17% D.F.

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

PROJECT PROFILE ON BISCUIT PRODUCTION

1. Background information

1.1. Introduction

Wheat is grown in most parts of the world, from near arctic to near equatorial latitudes. It is the most important crop among the cereals. Furthermore, the protein and caloric content of wheat is greater than that of any other food crop. Most wheat is consumed in the form of baked goods, mainly bread; therefore, wheat grains must be milled to produce flour prior to consumption. Wheat is also used as an ingredient in compound feedstuffs, Biscuits production, starch production and as a feed stock in ethanol production. There are various other uses such as in bread and other bakery products as well as in many other recipes in which wheat flour is used as main ingredient. An excellent source of complex carbohydrates is wheat flour. Wheat flour contains B vitamins, calcium, iron, magnesium, phosphorus, potassium, zinc, minimal amounts of sodium and other trace elements.

The milling industry is always looking for new value-added applications for wheat-milling products, like pasta, macaroni, biscuits and other baby foods, each offers an excellent example of the way that can add value to raw agricultural commodities. By doing so, it is possible to expand market for farmers, increase employment through processing, and provide a wide array of useful products to industry and consumers. It is obvious from the above that world-wide Wheat plays a highly significant role in terms of human food- both directly and indirectly. It also plays an important role in the Ethiopian context. According to the Central Statistics Authority, the estimated Wheat production in 2019/2020 (2012E.C.) was about 53,341,395 quintals. This growth in production is arise both from the expansion of hectare and from improved crop productivity.

PROJECT PROFILE ON BISCUIT PRODUCTION

1.2. Product description

A small, flat cake that is dry and usually sweet. Biscuit is a family of candy group, which is largely, consumed by children and teenagers. Biscuits can be savory, sweet, plain-baked, filled, or coated (or a mixture of several of these options). Some biscuits supply special dietary needs such as those for high fiber protein or external vitamins. Biscuit also contain fat and often sugar and are cut or molded into layers and baked rapidly thoroughly. When they packed with moisture proof material, they can have long shelf life.

1.3. Project location and justification

1.3.1. 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°01'48''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.

1.3.2. 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.

PROJECT PROFILE ON BISCUIT PRODUCTION

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).

1.3.3. 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 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.

PROJECT PROFILE ON BISCUIT PRODUCTION

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 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.

1.4. 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,

PROJECT PROFILE ON BISCUIT PRODUCTION

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 branches 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.

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.

1.4.1. The city benefit from the investment

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

- **Employment opportunity**

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.

1.5. Status of biscuit manufacturing factories in Ethiopia

Ethiopia has a private sector driven Wheat flour industry. According to the latest data sourced from Ethiopian investment commission (EIC) there are more about 113 companies registered to involve in production of biscuit and related products. The status of these companies is: 74% on pre-implementation, 10% on implementation and 16% on operation stages, their average supply capacity is 99,403,200 kg as shown in table 1.

PROJECT PROFILE ON BISCUIT PRODUCTION

2. Marketing study

2.1. 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.

2.2. The Supply of biscuit

2.2.1. Local biscuit Supply

In Ethiopia there are large scales, medium and household level Wheat value addition industries. According to the latest data sourced from Ethiopian investment commission (EIC) there are more about 113 companies registered to involve in production of biscuit and related products. The status of these companies is: 74% on pre-implementation, 10% on implementation and 16% on operation stages.

Table 1 Local supply of Biscuit in quintals

	2005	2006	2007	2008	2009	Average
Local Biscuit in quintals	1,533,890	488,480	313,260	2,160,000	474,530	994,032

Sources: - CSA

PROJECT PROFILE ON BISCUIT PRODUCTION

2.2.2. Import

The supply of Wheat flour has been met both through import and domestic production. Although there is no apparent trend in the growth of import Wheat flour has continuously been appearing in the import statistics.

Table 2 Volume of imported sweet Biscuit from 2012 to 2021 in kg

year	Gross Wt. (Kg)	Net Wt. (Kg)	CIF Value (ETB)	CIF Value (USD)	Total tax (ETB)	Total tax (USD)
2012	172,905	161,626	4,311,884	241,351	2,904,330	162,566
2013	405,765	378,821	10,921,227	580,913	5,850,928	311,218
2014	449,566	430,552	13,760,587	683,125	7,471,093	370,892
2015	462,755	435,282	13,159,921	633,236	7,720,331	371,491
2016	420,733	367,601	12,941,302	599,176	8,714,517	403,478
2017	627,589	567,863	18,191,145	751,176	12,264,980	506,464
2018	544,865	490,517	17,331,002	626,346	11,668,911	421,717
2019	0	0	0	0	0	0
2020	1,466,591	1,338,272	58,917,966	1,685,779	39,412,724	1,127,689
2021	1,015,188	828,250	44,817,060	1,011,215	29,745,985	671,164
Average	618,440	555,420	21,594,677	756,924	13,972,644	482,964

Source: Ethiopia customs Authority

As it has been shown in table 10 import of Wheat flour which was 45,610,716.81 kg at the beginning of the period (2011) has decreased to 3,838,464.88kg by the end of, 2018. A closer observation at the data set reveals that imported Wheat flour over the study period has shown varying patterns. Based on the data obtained from Ethiopia customs Authority, the annual average volume of imported Wheat flour is 27,971,480.07kg from 2011 through 2018.

PROJECT PROFILE ON BISCUIT PRODUCTION

2.2.2.1. Forecasted future import of Biscuit

Table 3 Future forecast of import of biscuit by trend adjusted exponential smoothing method

Year	Actual	Trend adjusted exponential smoothing
2012	161,626	
2013	378,821	
2014	430,552	
2015	435,282	
2016	367,601	
2017	567,863	
2018	490,517	
2019	0	
2020	1,338,272	
2021	828,250	
2022		828,250
2023		894,912
2024		961,575
2025		1,028,237
2026		1,094,900
2027		1,161,562
2028		1,228,224
2029		1,294,887
2030		1,361,549
2031		1,428,212
2032		1,494,874

Compiled: - by consultant

2.3. Biscuit Demand Projection

The demand for biscuit can be influenced by a number of factors. The size of population and its growth rate, disposable income, the tastes and preferences of Consumers and prices are few among many variables. However, data on some of these parameters are not readily available in Ethiopia.

PROJECT PROFILE ON BISCUIT PRODUCTION

Nevertheless, for the purpose of this study, attempts have been made to forecast the likely future demand for Biscuit on the basis of the following assumptions:

- i. Local supply of biscuit assumed to be increased by 2.5% every year based on the average local supply of biscuit which is, 994,032 quintals per year.
- ii. Ethiopia population is estimated to be 120,202,679 in 2022
- iii. Annual growth of population is taken to be 2.5%
- iv. Per capital consumption of biscuit is assumed to be 400gm/person/year

Table 4 Projected Demand for Wheat flour in Ethiopia

Year	Population	Forecasted demand for biscuit, based on 1.2kg/year /person	Demand in kg
2022	120,202,679	1.2	144,243,215
2023	123,207,746	1.2	147,849,295
2024	126,287,940	1.2	151,545,528
2025	129,445,138	1.2	155,334,166
2026	132,681,267	1.2	159,217,520
2027	135,998,298	1.2	163,197,958
2028	139,398,256	1.2	167,277,907
2029	142,883,212	1.2	171,459,854
2030	146,455,292	1.2	175,746,350
2031	150,116,675	1.2	180,140,010
2032	153,869,592	1.2	184,643,510

As it is indicated above the effective demand for Wheat flour in 2022 is 144,243Tons. This volume will increase to 184,643 tons in the year 2032.

PROJECT PROFILE ON BISCUIT PRODUCTION

2.4. Demand-Supply Gap Analysis

Table 5 Demand supply gap Analysis

Year	Domestic production in (kg)	Import in (kg)	Total supply in (kg)	Demand (kg)	Unsatisfied demand (in kg)
2022	99,403,200	828,250	100,231,450	144,243,215	44,011,765
2023	101,888,280	894,912	102,783,192	147,849,295	45,066,103
2024	104,435,487	961,575	105,397,062	151,545,528	46,148,466
2025	107,046,374	1,028,237	108,074,611	155,334,166	47,259,555
2026	109,722,534	1,094,900	110,817,434	159,217,520	48,400,086
2027	112,465,597	1,161,562	113,627,159	163,197,958	49,570,799
2028	115,277,237	1,228,224	116,505,461	167,277,907	50,772,446
2029	118,159,168	1,294,887	119,454,055	171,459,854	52,005,799
2030	121,113,147	1,361,549	122,474,696	175,746,350	53,271,654
2031	124,140,976	1,428,212	125,569,188	180,140,010	54,570,822
2032	127,244,500	1,494,874	128,739,374	184,643,510	55,904,136

As shown in the above table, the project will have unsatisfied demand for the coming ten years' period. It can be clearly noted that the supply is less than the demand. The projected unsatisfied demand will continue to be positive until 2032.

3. Technology and engineering

3.1. Technology

3.1.1. Biscuit production process flow diagram

Step-1:Pre-Mixing

In this section all the ingredients are mixed and poured in the mixer. At this stage- type of ingredient, its order of mixing, quantity, and temperature matters. Each ingredient has its own importance and action. The variables among the ingredients are water and ammonium bicarbonate (ABC), where water is used for dough making and ABC is used to increase height of biscuits.



Figure 1 Mixer

Step-2:Mixing

Dough formation known as mixing stage. In this step first creaming is performed, all the liquid materials are poured and mixed with sugar to make an evenly mixed liquid, then flour is poured and mixed with the creamed contents. The more we mix the harder dough becomes, less mixing results

PROJECT PROFILE ON BISCUIT PRODUCTION

in short dough. Generally, cookies are short dough biscuits whereas crackers are of hard dough fermented type. After mixing dough with the creamed ingredients dough is formed which is fed to the moulder.

Step-3:Molding

It is a critical step in biscuit manufacturing process in terms of biscuit finishing and weight. Large weight results in losses in terms of extra weight given to the buyer. This extra weight which gets packed to maintain the written weight is known as giveaway. In a moulder there is a knife placed in between a forcing roller and a die. There are two controls present 1st knife control in all four directions up, down, forward and back, and press control in both left and right side of the roller.



Figure 2 Biscuit moulder

Step-4: Baking

Baking consists of a number of chambers known as zone. Each zone is an independent oven with its own temperature setting. The large the plant capacity larger will be the number of zones. Biscuit

PROJECT PROFILE ON BISCUIT PRODUCTION

travels in a mild steel continental wire mesh inside the oven. Raising, puffing, and colouring occurs in a sequence with overlapped boundaries inside an oven. Finally, after the oven what is needs to be checked is weather the biscuit is fully baked, even texture, required height, and colour. Biscuit needs to be golden brown to dark chocolaty depending upon the variety.



Figure 3 Biscuit baking oven

Step-5: Sandwiching/Cooling (5- 10 min)

Post baking sandwiching is done for cream biscuits, whereas other varieties are sent to packing after passing through a cooling tunnel/conveyor. Sandwiching is the process in which a layer of cream is poured between two biscuits and a delicious cream biscuit is produced.



Figure 4 Biscuit cooling belt

Step-6: Packing

In packing there are various types of machines which pack the biscuits according to the pack weight i.e., 50g, 100g, 150g etc. and then after complete packing in corrugated fiber carton (CFC) they are sent for loading in trucks.

PROJECT PROFILE ON BISCUIT PRODUCTION

Input	Process	Responsibility	Out put
Raw materials from store /inputs/	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Inspecting and testing received raw material</div>	<ul style="list-style-type: none"> - Quality control 	Inspected and Tested raw material
Rejection	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Corrective action</div>	<ul style="list-style-type: none"> - Quality Control Chemist 	Received raw material as per the standard
Received raw material as per the standard	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Weighing as per the formulation</div>	<ul style="list-style-type: none"> - The Respective Operator 	Weighed as per formulation
Weighed as per formulation	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Mixing all raw material as per the formulation</div>	<ul style="list-style-type: none"> - The Respective Operator 	Dough Mixed / homogeneous
Dough Mixed /homogeneous	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Lamination</div>	<ul style="list-style-type: none"> - The respective operator 	Laminated and dividing to get the desired shape and weight
Laminated and dividing to get the desired shape and weight	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Stamping /Cutting</div>	<ul style="list-style-type: none"> • The Respective Operator 	Stamped/cut dough
Rejection	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Corrective action</div>	<ul style="list-style-type: none"> • Quality Control Chemist /Production supervisor 	Checked quality parameter of dough
Stamped/cut dough as per the standard	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Baking</div>	<ul style="list-style-type: none"> - Oven operator 	Baked product
Rejection	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Corrective action</div>	<ul style="list-style-type: none"> • Quality Control Chemist / Production supervisor 	Checked quality parameters
Stacked product	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Stacking</div>	<ul style="list-style-type: none"> - Oven operator 	Cooled product
Quality checked product for packing as per the standard	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Cooling</div>	<ul style="list-style-type: none"> - Oven operator 	Quality checked product for packing as per the standard
Rejection	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Packing</div>	<ul style="list-style-type: none"> - Oven operator 	Quality checked
	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Corrective action</div>	<ul style="list-style-type: none"> Quality Control Chemist / Production supervisor 	Quality checked
	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Finished Good to store</div>		

3.1.2. Environmental and social impact assessment of the project

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 biscuit. Potential environmental and social impacts due to the production of Biscuit products 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 measures include avoidance measures, mitigation measures and environmental enhancement measures. For the purpose of including environmental costs, the costs of wastewater treatment plant and solid waste incineration systems are included in the cost of machinery and equipment.

3.1.3. Production Capacity and Production Program

3.1.3.1. Plant capacity

The annual production capacity of the plant in full capacity is 2,812,500 cartons of Biscuit per year. The production capacity is based on projected demand and realistic market share that could be captured. The production commences three shift and 260 working days a year. 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 Wheat is low.

PROJECT PROFILE ON BISCUIT PRODUCTION

3.1.3.2. Production program

. The plant initially produces 70 % of its annual rated capacity bound to initial operating problems such as machine set up and marketing. The production capacity will increase by 10 % and attain its full capacity by the third year of its commencement.

Table 6 Production program in quantity

	Period			Start-up			Full Capacity	
	Capacity utilization			70%	80%	90%	100%	100%
	Project year			1	2	3	4	5
	Product type	Unit of measurement	At full capacity					
1	Biscuit	Carton	2,812,500	1,968,750	2,250,000	2,531,250	2,812,500	2,812,500
	Sub Total			1,968,750	2,250,000	2,531,250	2,812,500	2,812,500

PROJECT PROFILE ON BISCUIT PRODUCTION

3.2. Engineering

3.2.1. Land, buildings and civil works

The required area (m^2) and construction cost for the production facilities essential for the successful operation of the processing plant is shown in Table 7. A total area ready for the processing plant is $10,000m^2$ out of which $5,100m^2$ is to be covered by building while uncovered area of $4,900m^2$ 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 M^2 to 2,800.71 birr per M^2 respectively. Therefore, for the profile a land lease rate of birr 3,885 per M^2 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 m^2 to 25,000.00 Birr per m^2 . The total construction cost of buildings and civil works, at a rate of Birr 20,000 per m^2 is estimated at Birr 82.61 million. Therefore, the total cost of land lease and construction of buildings and civil works is estimated at Birr 121.46 million.

The proposed plant layout comprises the following buildings and structures.

PROJECT PROFILE ON BISCUIT PRODUCTION

Table 7 Building costs

S/No	Descriptions	Total area	Estimated cost per square meter (in Birr)	Total estimated cost (in Birr)	Remarks
1	Raw materials store	1,500M ²	20,000.00	30,000,000.00	
2	Damping pit	9M ²	20,000.00	180,000.00	
3	Cleaning section	200M ²	20,000.00	4,000,000.00	
4	Biscuit production line	1,000M ²	20,000.00	20,000,000.00	
6	Main product store	500 M ²	20,000.00	10,000,000.00	
7	packing materials store	300 M ²	20,000.00	6,000,000.00	
8	Office and toilet	200M ²	20,000.00	4,000,000.00	
9	Canteen	160M ²	20,000.00	3,200,000.00	
10	Guard house	6M ²	20,000.00	120,000.00	
11	parking	600M ²	5,000	3,000,000.00	
12	Green area	625M ²	500	312,500.00	
13	Fence	1,200M	600*2*1,500	1,800,000.00	
	TOTAL	5,100 M²		82,612,500.00	

PROJECT PROFILE ON BISCUIT PRODUCTION

Table 8 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 9 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 BISCUIT PRODUCTION

3.2.2. Machinery and equipment

The main plant and machinery consists mixer, laminating oven, and packing machine and etc. Major part of the machinery will be imported.

Table 10 Lists of Biscuit line machineries

S/No	Descriptions	Total costs
1	Mixer	85,000,000.00
2	Electrical oven	
3	Rotary mould	
4	Rotary cutting mould	
6	Colling conveyor	
7	Packing machine	
8	Laminator machine	
9	Creaming machine	
	TOTAL	

3.2.3. lists of machinery suppliers



WENZHOU KINGSUN MACHINERY INDUSTRIAL CO.,LTD.

Tel: +86-577-88939966 88902233

Fax: +86-577-88939977

Website: <https://www.kingsunmachinery.com/>

QQ : [2355781108](https://www.qq.com/)

E-mail: sales@kingsunmachinery.com

E-mail: mikeli2008@vip.sina.com

Skype: [kingsungroup](https://www.skype.com/)

Contact: Mr. Mike Li (Manager)

Address: No.1002, Heyuan Mansion, Xincheng, Wenzhou City, Zhejiang Province, P.R. China.

PROJECT PROFILE ON BISCUIT PRODUCTION

4. Biscuit factory 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

Table 11 Annual manpower costs

S/No	Description	Number of persons	Salary in birr	
			monthly	annually
1	General manager	1	35,000.00	420,000.00
2	executive secretary	1	10,000.00	120,000.00
5	Manager- admin. and finance	1	25,000.00	300,000.00
7	accountant	1	20,000.00	240,000.00
10	cashier	1	7,500.00	90,000.00
13	guards	5	3,500.00	210,000.00
14	messenger and cleaner	1	3,500.00	42,000.00
15	driver ii	4	7,500.00	360,000.00
16	production and technical head	1	30,000.00	360,000.00
21	operator	3	7,500.00	270,000.00
22	assistant machine operator	6	5,000.00	360,000.00
23	senior mechanics	3	12,000.00	432,000.00
25	senior electrician	3	12,000.00	432,000.00
26	shift electrician	3	10,000.00	360,000.00
27	shift mechanic	3	10,000.00	360,000.00
28	store keeper	1	10,000.00	120,000.00
29	manager- commercial	1	20,000.00	240,000.00
30	purchaser	1	10,000.00	120,000.00
31	sales- manager	1	15,000.00	180,000.00
32	sales clerk	1	7,500.00	90,000.00
	Total	42	301,000.00	5,106,000

5. Financial Analysis

5.1. General

The financial analysis evaluation of Biscuit production 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

PROJECT PROFILE ON BISCUIT PRODUCTION

most of the capital assets are assumed to be depreciated, debts recovered and pay-back period accomplished.

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 1% 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 12 Initial Fixed investment costs

S/No	Fixed investment type	Unit of measurement	Quantity	Unit price	Total Amount	Remarks
1	Land	Square meter	10,000	3,885 birr/M ²	38,850,000.00	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	5,100	lump sum	82,612,500.00	
	Sub total				121,462,500.00	
3	Machineries	set	2	Lump sum	85,000,000.00	
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				97,500,000.00	
	Fixed capital investment costs				218,962,500.00	
8	pre-operational expenses				2,000,000.00	
	Working capital				58,237,000.00	
	TOTAL INVESTMENT COSTS				279,199,500.00	

PROJECT PROFILE ON BISCUIT PRODUCTION

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 17 major categories of the total production costs are assembled into the following cost elements.

5.5.1. Material inputs

In the project under study the basic material inputs (see in table 13) are Flour, chemicals, packing materials etc. Therefore, the current prevailing local and international market prices have been used for estimation of

PROJECT PROFILE ON BISCUIT PRODUCTION

material inputs costs. At full capacity operation the material inputs costs are estimated at Birr 525.95 million per annum.

Table 13 Raw materials input plan in Birr'000'

Type of raw materials	Required quantity per kg	Required quantity at full capacity in kg / year	cost/kg in birr	Total cost at full capacity in birr
Wheat Flour		5,307,600	52.00	275,995,200.00
Sugar	0.2139	1,604,057	80.00	128,324,560.00
Vegetable Fat	0.0871	653,274.29	85.00	55,528,314.65
Ammonium Bicarbonate	0.0125	93,875.16	34.50	3,238,693.02
Sodium Bicarbonate	0.0048	36,361.26	50.00	1,818,063.00
Sodium Meta Bisulphate	0.0009	6,557.12	50.00	327,856.00
Soyalecithine	0.0011	8,077.94	89.00	718,936.66
Salt	0.0045	33,866.19	12.50	423,327.38
Vanilla Flavour	0.0011	8,077.94	350.00	2,827,279.00
Citric Acid	0.0001	403.90	76.00	30,696.40
Corn starch	0.0027	20,194.84	40.00	807,793.60
Tartazine color	0.0004	3,029.81	650.00	1,969,376.50
Sunset yellowish color	0.0004	3,029.81	578.00	1,751,230.18
Sub Total				473,761,326.39
Cost of Packing Materials				
	Required quantity per kg	Quantity at full capacity in kg / year	cost/kg in birr	Total cost at full capacity in birr
film	0.0193	145,089.29	120.00	17,410,711.00
Sub Total				17,410,711.00
cartons and others	Units	Quantity at full capacity in pc / year	Cost/pc in birr	Total cost at full capacity in birr
Carton	Pcs	2,812,500	12.00	33,750,000.00
Sub Total				33,750,000.00
Ink Roller	Pcs	2,344	110.00	258,261.92
Self-Adhesive	Pcs	16,741	46	770,086.00
Sub Total				1,028,347.92
Grand total				525,950,385.31

PROJECT PROFILE ON BISCUIT PRODUCTION

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.

Table 14 Utilities of the factory'000''Birr

Utility'000''Birr		Start-up			Full Capacity
		70 %	80 %	90 %	
Capacity utilization		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>

PROJECT PROFILE ON BISCUIT PRODUCTION

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.

Table 15 Overhead costs

Direct Overhead”000”Birr		Year 1	Year 2	Year 3	Year 4
Annual land lease Payment		5,550	5,550	5,550	5,550
Insurance					
Building and Civil works	0.10%	82.60	82.60	82.60	82.60
Machinery and Equipment	0.20%	170	170	170	170
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	84.00	84.00	84.00	84.00
Cleaning and sanitation	An estimate of 300 Birr/day	78.00	78.00	78.00	78.00
Sub Total		6,074.60	6,074.60	6,074.60	6,074.60
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		6,182.60	6,182.60	6,182.60	6,182.60

PROJECT PROFILE ON BISCUIT PRODUCTION

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 16 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	82,612,500.00	5% of original value	4,131.00	4,131.00	4,131.00	4,131.00
Machinery and equipment	85,000,000.00	15 % of original value	12,750.00	12,750.00	12,750.00	12,750.00
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			19,281.00	19,281.00	19,281.00	19,281.00

PROJECT PROFILE ON BISCUIT PRODUCTION

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 = 492,188,000 Birr

Unit selling price = 250 Birr/kg

$$\text{BEP (sales)} = \frac{\text{Annual sales} \times \text{Annual fixed costs}}{\text{Annual sales} - \text{Annual variables costs}} = \frac{492,188,000 \times 53,046,000}{492,188,000 - 381,084,000}$$

BEP (Sales) = 234,992,481 Birr

B. BEP production

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

BEP production = 234,992,481/250 = 939,970

$$\begin{aligned} \text{c. BEP percentage} &= \frac{\text{Annual fixed costs} \times 100\%}{\text{Annual sales} - \text{Annual variables costs}} \\ &= \frac{53,046,000,000 \times 100\%}{492,188,000 - 381,084,000} \\ &= 47.74\% \end{aligned}$$

5.6.2. Return on investment

Return on investment = Net profit /Total capital requirement

$$= 38,033,000/279,199,500$$

$$= 13.60\%$$

The return on owners' investment (ROOI)

= Annual net profit /owners' investment

$$= 38,033,000/83,759,850$$

$$= 45\%$$

5.7. Project benefits

For financial analysis and evaluation of the given project, the current raw wheat flour, chemical price, and packing materials buying price and final packed biscuit price at the project gate has been taken as a basis. Consequently, based on the recent market survey, at the nearby market pints' delivery price of packed biscuit has been indicated in table 19.

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 20 and Annex Table 22, 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 703 million Birr per annum. The Net Income Statement shows a steady growth of gross profit starting from 58 million Birr in year 1 reaching the peak of 142 million Birr in year 10. In its 10 years of manufacturing activities, the project is expected to generate

PROJECT PROFILE ON BISCUIT PRODUCTION

a total net profit of 726 million Birr and contribute 391 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 22 of “Cash Flow Statement” shows the positive cumulative cash balance of Birr 671 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 27 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 28 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 369 million Birr at 17%D.F. and the benefit-cost ratio of 1.14 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 47.74% operation of the estimated full capacity

In addition to this, finally, summary of financial efficiency tests have been conducted in Annex table 26, 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

PROJECT PROFILE ON BISCUIT PRODUCTION

NNEX II

CALCULATION OF ANNUAL PRODUCTION COSTS

Table 17 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	368,165	420,760	473,355	525,950	525,950	525,950	525,950	525,950	525,950	525,950
II. Labor	5,106	5,106	5,106	5,106	5,106	5,106	5,106	5,106	5,106	5,106
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)	3,284	3,284	3,284	3,284	3,284	3,284	3,284	3,284	3,284	3,284
VI Direct overheads	6,075	6,075	6,075	6,075	6,075	6,075	6,075	6,075	6,075	6,075
A. Direct Production costs	387,339	440,394	493,449	546,505	546,505	546,505	546,505	546,505	546,505	546,505
VII. Administration over head	108	108	108	108	108	108	108	108	108	108
VIII. Marketing and Promotional expense 1% of sales revenue	4,926	5,630	6,334	7,038	7,038	7,038	7,038	7,038	7,038	7,038
B. Operating costs	392,373	446,132	499,891	553,651	553,651	553,651	553,651	553,651	553,651	553,651
Interest	22,476	21,164	19,701	18,069	16,251	14,221	11,962	9,440	6,629	3,495
Depreciation	19,281	19,281	19,281	19,281	18,781	18,681	13,836	4,131	4,131	4,131
C. Total production costs	434,130	486,577	538,873	591,001	588,683	586,553	579,449	567,222	564,411	561,277

PROJECT PROFILE ON BISCUIT PRODUCTION

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 18 Calculation of working capital

Cost category	Minimum Days of coverage	Coeff-icient 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	39,237	44,613	49,989	55,365	55,365	55,365	55,365	55,365	55,365	55,365
B. Inventory												
1. Material inputs	26	10	36,817	42,076	47,336	52,595	52,595	52,595	52,595	52,595	52,595	52,595
2. Spare parts	90	4	821	821	821	821	821	821	821	821	821	821
3. Work under process	2	130	2,980	3,388	3,796	4,204	4,204	4,204	4,204	4,204	4,204	4,204
4. Product ready for delivery	8	32.5	12,026	13,659	15,291	16,924	16,924	16,924	16,924	16,924	16,924	16,924
C. Cash on hand	90	4	3,643	3,643	3,643	3,643	3,643	3,643	3,643	3,643	3,643	3,643
D. Current assets			95,524	108,200	120,876	133,552	133,552	133,552	133,552	133,552	133,552	133,552
II. Current liabilities												
A. A/p	26	10	37,287	42,593	47,898	53,204	53,204	53,204	53,204	53,204	53,204	53,204
III. Working capital												
A. Net working capital			58,237	65,607	72,978	80,348	80,348	80,348	80,348	80,348	80,348	80,348
B. Increasing in working capital			58,237	7,370	7,371	7,370	0.0	0.0	0.0	0.0	0.0	0.0

PROJECT PROFILE ON BISCUIT PRODUCTION

ANNEX V

PROJECTED SALES REVENUE

Table 19 projected sales revenue”000”

	Period			Start-up			Full Capacity							
	Capacity utilization			70%	80%	90%	100%	100%						
	Project year			1	2	3	4	5	6	7	8	9	10	
	Product type		Unit price											
2	Biscuits	Carton (2,812,500)	250	492,188	562,500	632,813	703,125	703,125	703,125	703,125	703,125	703,125	703,125	
3	Biscuit scrape	Quintals	2,500	455	520	585	650	650	650	650	650	650	650	
				492,643	563,020	633,398	703,775	703,775	703,775	703,775	703,775	703,775	703,775	

PROJECT PROFILE ON BISCUIT PRODUCTION

ANNEX VI

PROJECTED NET INCOME STATEMENT

Table 20 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	492,643	563,020	633,398	703,775	703,775	703,775	703,775	703,775	703,775	703,775
Less total production costs	434,130	486,577	538,873	591,001	588,683	586,553	579,449	567,222	564,411	561,277
Gross profit	58,513	76,443	94,525	112,774	115,092	117,222	124,326	136,553	139,364	142,498
Tax	20,480	26,755	33,084	39,471	40,282	41,028	43,514	47,794	48,777	49,874
Net profit	38,033	49,688	61,441	73,303	74,810	76,194	80,812	88,759	90,587	92,624
Accumulated undistributed profit	38,033	87,721	149,162.65	222,466	297,276	373,470	454,282	543,041	633,628	726,252

PROJECT PROFILE ON BISCUIT PRODUCTION

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

Table 21 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	195,440	184,030	171,309	157,124	141,309	123,675	104,013	82,090	57,646	30,390
2. Outstanding balance at end of year										
a. First year loan	195,440	184,030	171,309	157,124	141,309	123,675	104,013	82,090	57,646	30,390
Total										
A. Debt service										
1. First year Loan										
a. Interest	22,476	21,164	19,701	18,069	16,251	14,221	11,962	9,440	6,629	3,495
b. Repayment of principal	11,409	12,722	14,184	15,815	17,634	19,662	21,923	24,444	27,256	30,390

PROJECT PROFILE ON BISCUIT PRODUCTION

ANNEX VIII CASH-FLOW STATEMENT FOR FINANCIAL PLANING

Table 22 Projected Cash flow statement

Period	Start up			Full capacity							
	70%	80%	90%	100%							
Capacity utilization											
Project year	1	2	3	4	5	6	7	8	9	10	
Item description											
A. Cash - inflow	809,130	575,696	646,074	716,450	703,775	703,775	703,775	703,775	703,775	703,775	
1. Financial resource (total)	316,487	12,676	12,676	12,675							
2. Sales revenue	492,643	563,020	633,398	703,775	703,775	703,775	703,775	703,775	703,775	703,775	
B. Cash – outflow	763,225	519,449	579,536	639,682	627,818	628,562	631,050	635,329	636,313	637,410	
1. Total assets schedule including replacement	316,487	12,676	12,676	12,676							
2. Operating costs	392,373	446,132	499,891	553,651	553,651	553,651	553,651	553,651	553,651	553,651	
3. Debt service (total)											
a. Interest	22,476	21,164	19,701	18,069	16,251	14,221	11,962	9,440	6,629	3,495	
b. Repayment	11,409	12,722	14,184	15,815	17,634	19,662	21,923	24,444	27,256	30,390	
4. Tax	20,480	26,755	33,084	39,471	40,282	41,028	43,514	47,794	48,777	49,874	
C. Surplus (Deficit)	45,905	56,247	66,538	76,768	75,957	75,213	72,725	68,446	67,462	66,365	
D. Cumulative cash balance	45,905	102,152	168,690	245,458	321,415	396,628	469,353	537,799	605,261	671,626	

PROJECT PROFILE ON BISCUIT PRODUCTION

ANNEX XII TOTAL INVESTMENT COSTS

Table 23 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	218,963											
b. Replacement												
2. Pre-operational capital expenditure	2,000											
3. Working capital increase	58,237	7,370	7,371	7,370								
Total investment costs	279,200	7,370	7,371	7,370								

ANNEX XIII TOTAL ASSETS

Table 24 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	218,963											
❖ Cost of land												
d. Replacement												
2. Pre-operational capital expenditure	2,000											
3. Current assets increase	95,524	12,676	12,676	12,676								
Total assets	316,487	12,676	12,676	12,676								

PROJECT PROFILE ON BISCUIT PRODUCTION

ANNEX XIV SOURCES OF FINANCE

Table 25 Sources of finance

Period	Start up			Full capacity							
	1	2	3	4	5	6	7	8	9	10	Total
Sources of finance											
1. Equity capital	83,760	7,370	7,371	7,370							
2. Loan capital	195,440										
3. Current liabilities	37,287	5,306	5,305	5,305							
Total finance	316,487	12,676	12,676	12,675							

ANNEX XI SUMMARY OF FINANCIAL EFFECIENCY TESTS

Table 26 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	12%	14%	15%	16%	16%	17%	18%	19%	20%	20%
2. Net profit : Revenue	8%	9%	10%	10%	11%	11%	11%	13%	13%	13%
3. Net profit : initial investment	14%	17%	21%	24%	25%	25%	27%	29%	30%	31%
4. Net profit : Equity	45%	55%	62%	69%	71%	72%	76%	84%	86%	87%
5. Gross profit : Initial investment	21%	27%	32%	37%	38%	39%	41%	45%	46%	47%
6. Operating costs : Revenue	80%	79%	79%	79%	79%	79%	79%	79%	79%	79%

PROJECT PROFILE ON BISCUIT PRODUCTION

ANNEX XV CALCULATIONS OF PAYBACK PERIOD

Table 27 Calculation of payback period”000”

Year	Amount Paid Back			Total investment	End of year
	Net Profit	Depreciation	Total		
1	38,033	19,281	57,314	279,200	-221,886
2	49,688	19,281	68,969	7,370	-160,287
3	61,441	19,281	80,722	7,371	-86,936
4	73,303	19,281	92,584	7,370	-1,722
5	74,810	18,781	93,591	0.00	+91,869

PROJECT PROFILE ON BISCUIT PRODUCTION

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

Table 28 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	492,643	0.854701	421,062	279,200	392,373	671,573	573,994
2	563,020	0.730514	411,294	7,370	446,132	453,502	331,290
3	633,398	0.624371	395,475	7,371	499,891	507,262	316,720
4	703,775	0.53365	375,570	7,370	553,651	561,021	299,389
5	703,775	0.456111	321,000		553,651	553,651	252,526
6	703,775	0.389839	274,359		553,651	553,651	215,835
7	703,775	0.333195	234,494		553,651	553,651	184,474
8	703,775	0.284782	200,422		553,651	553,651	157,670
9	703,775	0.243404	171,302		553,651	553,651	134,761
10	703,775	0.208037	146,411		553,651	553,651	115,180
Total			2,951,389				2,581,838

A. Benefit- cost ratio at 17% D.F. = 1.14

B. NPV at 17% D.F. = 369,551,000 Birr