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# PROJECT PROFILE ON SOAP PRODUCTION

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JULY 26, 2022

ADDIS ABEBA CITY ADMINISTRATION INVESTMENT COMMISSION

# PROJECT PROFILE ON SOAP PRODUCTION

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## I. Executive summary

This project profile is prepared to assess the viability of running Soap and detergent 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 Soap and detergent 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 Soap and detergent industry. According to the latest data sourced from Ethiopian investment commission (EIC) there are more about 701 companies registered to involve in production of soap and detergent production and related products. The status of these companies is: 56% on pre-implementation, 11% on implementation and 33% on operation 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 most locally available raw materials for soap and detergent factory are tallow, caustic soda and filler.

The factory at full capacity operation can produces 2,500,000 pcs of 200gm soap 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 293.62 million. Out of the total investment capital, the owners will cover Birr 88.08 million (30 %) while the remaining balances amounting to Birr 205.53 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 53.43 Million in the first year to Birr 60.98 million at the end of the 10<sup>th</sup> year of operation. At the end of the 10<sup>th</sup> year of operation period the cumulative cash balance reaches Birr 633.84 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 351 million Birr at 17%D.F. and the benefit-cost ratio of 1.25 at 17% D.F.

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

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## 1. Background information

### 1.1. Introduction

This document was undertaken to show soap production and detergent 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 soap and detergent 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.

Soap production is an industry of prime importance to developing countries because, by upgrading generally available local resources, it can satisfy existing demand for soap and unsophisticated detergents. It also complements oleaginous product lines where a soap factory is upstream of an existing oil mill. In Ethiopia, the demand for soap product is expected to increase considerably in the next few decades as a result of increased population growth, urbanization and increasing income levels.

### 1.2. Product description

Soaps are compounds formed by the reaction of bases with fats, chemically known as fatty acid esters. The three most important fatty acid esters: Palmitin, Stearin and Olein. They are found in lard, tallow, olive oil, cottonseed oil, and other animal and vegetable fats or oils. Soap is usually made by the reaction of animal fat or vegetable oil with sodium hydroxide. The process of treating

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fats with bases or alkalies is called 'Saponification'. Vegetable oils, with unsaturated carbon chains, produce soft soaps. Animal fats yield hard soaps. Coconut oils with shorter carbon chains yield soaps that are more soluble in water. Soaps are salts particularly sodium or potassium of long chain fatty acids. These carboxylic acids are derived from fatty oils. The principal active cleaning agent is sodium carboxylate

Soap use in households, guest houses, hotels, canteens, hospitals, schools and higher institutions, offices, etc. as a general cleaning agent. It is used to wash hands, dishes, cooking and other household utensils, tiles, walls, kitchens, motor vehicles, furniture, clothes etc.

## 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 km<sup>2</sup> of which 18.2 km<sup>2</sup> are rural. Addis Ababa's built-up urban area spans 474 km<sup>2</sup>. 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. 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.

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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 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

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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, 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.

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- 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

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payable directly to the producers. In addition, domestic products save foreign exchange and exports also bring money to the country.

### 1.5. Status of soap manufacturing industry in Ethiopia

According to the latest data sourced from Ethiopian investment commission (EIC) there are more about 701 companies registered to involve in production of soap and detergent production and related products. The status of these companies is: 56% on pre-implementation, 11% on implementation and 33% on operation stages.

### 1.6. Raw materials availability

The necessary raw materials required for manufacturing toilet soap are available through imports and domestic sources. Import materials are oil, color and perfume, while domestically available materials are fat/tallow, sodium chloride and packing materials. Tallow, which can be found in the region may not be sufficient and has to be imported

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## 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 soap

#### 2.2.1. Local soap Supply

In Ethiopia there are large scales, medium and household level soap manufacturing plant. The total soap and detergent supplied in five years from 2005 E.C. to 2009 E.C. by local manufactures is shown in table 1.

Table 1 Soap and detergent produced per year in Ethiopia, in kg

Description	2005	2006	2007	2008	2009	Average
Local Soap and detergent production	84,900,000	90,959,000	117,453,000	525,081,000	852,333,000	334,145,200

Sources: - CSA

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### 2.2.2. Import

The supply of soap and detergent has been met both through import and domestic production. Although there is no apparent trend in the growth of imported soap and detergent.

Table 2 Volume of imported soap and detergent from 2012 to 2021 in kg

Year	Gross weight (in Kg)	Net weight (in Kg)	CIF value in (ETB)	CIF value in USD	Total TAX in ETB	Total Tax USD
2012	59,205,333	37,895,694	756,312,330	42,333,441	367,044,828	20,544,780
2013	28,867,575	27,821,166	607,808,404	32,330,062	294,355,997	15,657,151
2014	40,264,397	39,220,857	924,734,106	45,907,092	399,522,702	19,833,729
2015	45,836,220	44,822,685	964,401,147	46,405,598	371,442,588	17,873,284
2016	29,195,537	28,539,081	578,804,603	26,798,370	207,665,420	9,614,808
2017	56,511,716	55,615,547	1,309,343,354	54,067,339	492,332,548	20,330,123
2018	26,870,606	26,429,759	625,762,618	22,615,201	224,840,813	8,125,797
2019	0	0	0	0	0	0
2020	67,673,396	66,782,534	2,170,741,836	62,109,924	935,313,593	26,761,476
2021	66,303,372	65,531,671	3,134,993,651	70,735,416	1,238,702,951	27,949,074
Average	42,072,815	39,265,899	1,107,290,205	40,330,245	453,122,144	16,669,022

Source: ERCA and compiled by consultant

As it has been shown in table 2 import of Soap and detergent which was 37,895,694 kg at the beginning of the period (2012) has increased to 65,531,671kg by the end of, 2021. A closer observation at the data set reveals that imported soap and detergent over the study period has shown varying patterns. Based on the data obtained from Ethiopia customs Authority, the annual average volume of imported soap and detergent is 39,265,899 kg from 2012 through 2021.

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### 2.2.2.1. Forecasted future import of soap and detergent

Table 3 Future forecast of import of soap and detergent by trend adjusted exponential smoothing method

Year	Imported soap and detergent from 2012 to 2021 in kg.	Trend Adjusted exponential smoothing method
2012	37,895,694	
2013	27,821,166	
2014	39,220,857	
2015	44,822,685	
2016	28,539,081	
2017	55,615,547	
2018	26,429,759	
2019	0	
2020	66,782,534	
2021	65,531,671	
2022		65,531,671
2023		68,295,269
2024		71,058,866
2025		73,822,464
2026		76,586,062
2027		79,349,660
2028		82,113,257
2029		84,876,855
2030		87,640,453
2031		90,404,050
2032		93,167,648

Compiled: - by consultant

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### 2.2.2.2. Soap and detergent Demand Projection

The demand for soap and detergent can be influenced by a number of factors. The demand for soap and detergent is a function of population and its growth rate, disposable income, price of soap and detergent, price of substitutes, and are few among many variables. for the purpose of this study, attempts have been made to forecast the likely future demand for soap and detergent on the basis of the following assumptions:

- i. Ethiopian population is 120,202,679 as of today (2022)
- ii. Local supply of soap and detergent assumed to be increased by 2.5% every year
- iii. Per capital Consumption of soap and detergent is assumed to be 4kg/person/ per year.

Table 4 Projected Demand for soap and detergent soap and detergent in Ethiopia

Year	Number of population	Per-capital consumption is 4kg /person/year	Soap and detergent demand projection in kg
2022	120,202,679	4	480,810,716
2023	123,207,746	4	492,830,984
2024	126,287,940	4	505,151,758
2025	129,445,138	4	517,780,552
2026	132,681,267	4	530,725,066
2027	135,998,298	4	543,993,193
2028	139,398,256	4	557,593,023
2029	142,883,212	4	571,532,848
2030	146,455,292	4	585,821,170
2031	150,116,675	4	600,466,699
2032	153,869,592	4	615,478,366

As it is indicated above the demand for soap and detergent in 2022 is 480,810,716 kg. This volume will increase to 615,478,366 kg in the year 2032.

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### 2.2.2.3. Demand-Supply Gap Analysis

When we see the historical supply volume of soap and detergent in Ethiopia there is no apparent trend in the growth. Because both the import and production data are found to be erratic. Hence, it is found difficult to objectively forecast the future supply volume. Trend adjusted exponential smoothing method was used, for forecasting purposes. A 2.5% growth rate, of population, is also assumed for local production increase, for new as well as expansion projects for domestic manufacturers though most of the existing soap and detergent factories.

Table 5 Demand supply gap Analysis

Year	Domestic production in (in kg)	Import in (kg)	Demand (in kg)	Excess demand(kg)
2022	378,054,624	65,531,671	480,810,716	102,756,092
2023	387,505,989	68,295,269	492,830,984	105,324,995
2024	397,193,639	71,058,866	505,151,758	107,958,119
2025	407,123,480	73,822,464	517,780,552	110,657,072
2026	417,301,567	76,586,062	530,725,066	113,423,499
2027	427,734,106	79,349,660	543,993,193	116,259,087
2028	438,427,459	82,113,257	557,593,023	119,165,564
2029	449,388,145	84,876,855	571,532,848	122,144,703
2030	460,622,849	87,640,453	585,821,170	125,198,321
2031	472,138,420	90,404,050	600,466,699	128,328,279
2032	483,941,881	93,167,648	615,478,366	131,536,485

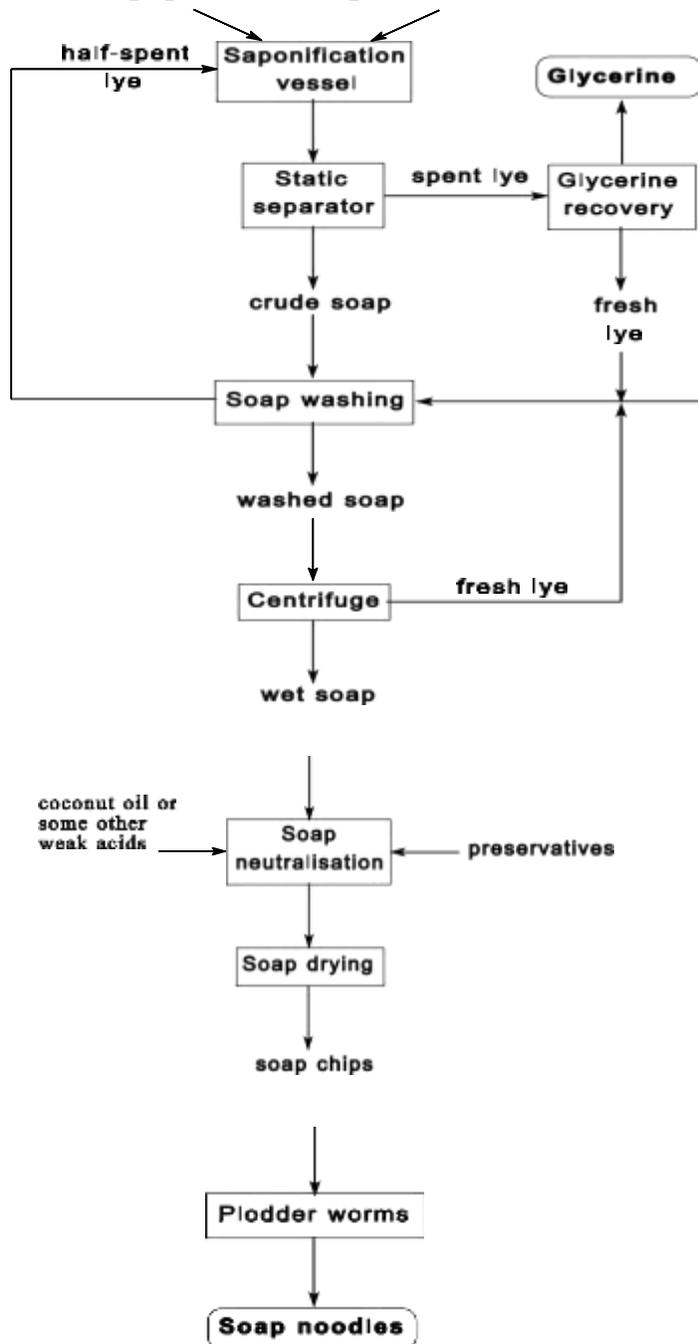
As shown in the above table, the project will have unsatisfied demand for the coming 10 years' period. The projected demand will continue to be positive until 2032. It can be clearly noted that there is a huge gap between supply and demand figures, which can really be taken as the apparent demand-supply gap for soap and detergent in Ethiopia. This is really the actual unsatisfied demand as imports have to be substituted that also helps in saving the foreign currency outflow from the country. The unsatisfied demand for soap and detergent for the year 2032 estimated at 131,536,485 kg.

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## 3. Technology and engineering

### 3.1. Technology

#### 3.1.1. Soap production process



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### Step 1 – Saponification

The raw materials are continually fed into a reactor in fixed proportions. The ingredients alone would give a low water, high glycerin soap. Soap needs to be about 30% water to be easily pumpable, and even then needs to be held at around 70°C, so excess lye is added to hydrate the soap and dissolve out some of the glycerin. The lye added is known as "half spent lye" and is the lye discharged from the washing column. This lye already contains some glycerin, but it is further enriched by that formed in the saponification reaction.

### Step 2 - Lye separation

The wet soap is pumped to a "static separator" - a settling vessel which does not use any mechanical action. The soap / lye mix is pumped into the tank where it separates out on the basis of weight. The spent lye settles to the bottom from where it is piped off to the glycerin recovery unit, while the soap rises to the top and is piped away for further processing.

### Step 3 - Soap washing

The soap still contains most of its glycerin at this stage, and this is removed with fresh lye in a washing column. The column has rings fixed on its inside surface. The soap solution is added near the bottom of the column and the lye near the top. As the lye flows down the column through the center, a series of rotating disks keeps the soap / lye mixture agitated between the rings. This creates enough turbulence to ensure good mixing between the two solutions.

The rate of glycerin production is calculated and the rate at which fresh lye is added to the washing column then set such that the spent lye is 25 - 35 % glycerin. Glycerin is almost infinitely soluble in brine, but at greater than 35% glycerin the lye no longer efficiently removes glycerin from the soap. The soap is allowed to overflow from the top of the column

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and the lye ("half spent lye") is pumped away from the bottom at a controlled rate and added to the reactor.

### Step 4 - Lye separation

The lye is added at the top of the washing column, and the soap removed from the column as overflow. As the lye is added near the overflow pipe the washed soap is about 20% fresh lye, giving the soap unacceptably high water and caustic levels. Separating off the lye lowers the electrolyte levels to acceptable limits.

The soap and lye are separated in a centrifuge, leaving a soap which is 0.5% NaCl and 0.3% NaOH, and about 31% water. The lye removed is used as fresh lye

### Step 5 - Neutralization

Although the caustic levels are quite low, they are still unacceptably high for toilet and laundry soap. The NaOH is removed by reaction with a weak acid such as coconut oil (which contains significant levels of free fatty acids), coconut oil fatty acids, citric acid or phosphoric acid, with the choice of acid being made largely on economic grounds.

Some preservative is also added at this stage

### Step 6 - Drying

Finally, the water levels must be reduced down to about 12%. This is done by heating the soap to about 125°C under pressure (to prevent the water from boiling off while the soap is still in the pipes) and then spraying it into an evacuated chamber at 40 mm Hg. The latent heat of evaporation lost as the water boils off reduces the soap temperature down to 45°C, at which temperature it solidifies onto the chamber walls.

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The soap chips are scraped off the walls and "plodded" (i.e. squeezed together) by screws known as "plodder worms" to form soap noodles. The soap is now known as base or neat soap chip, and can be converted into a variety of different soaps in the finishing stages.

### **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 soap. Potential environmental and social impacts due to the production of soap 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. Social responsibility cost estimated to be 1% of fixed investment costs.

### **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 2,500,000 kg of soap. The production capacity is based on projected demand and realistic market share that could be captured. The

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production commences three shift and 260 working days a year. The production program does not include Sundays and national and public holidays.

### 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 fourth year of its commencement.

Table 6 Production program

Period		Start-up			Full Capacity	
		70%	80%	90%	100%	100%
Capacity utilization						
Project year		1	2	3	4	5
Soap	kg	1,750,000	2,000,000	2,250,000	2,500,000	2,500,000

### 3.2. Engineering

#### **3.2.1. Land, buildings and civil works**

The required area (m<sup>2</sup>) 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<sup>2</sup> out of which 7,111 m<sup>2</sup> is to be covered by building while uncovered area of 2,889 m<sup>2</sup> is left open for parking, 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<sup>2</sup> to 2,800.71 birr per M<sup>2</sup> respectively. Therefore, for the profile a land lease rate of birr 3,885 per M<sup>2</sup> 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 1,800.00 Birr per m<sup>2</sup> to 25,000 Birr per m<sup>2</sup>. The total construction cost of buildings and civil works, at a rate of Birr 20,000 per m<sup>2</sup> is estimated at Birr 123.55 million. Therefore, the total cost of land lease and construction of buildings and civil works is estimated at Birr 163.775 million.

The proposed plant layout comprises the following buildings and structures.

## PROJECT PROFILE ON SOAP PRODUCTION

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Table 7 Building costs

S/No	Descriptions	Total area in M <sup>2</sup>	Estimated cost per square meter (in Birr)	Total estimated cost ( in Birr)
1	Raw materials store	1,500	20,000.00	30,000,000.00
2	Soap production line	2,000	20,000.00	40,000,000.00
3	Main product store	1,500	20,000.00	30,000,000.00
4	packing materials store	500	20,000.00	10,000,000.00
5	Office and toilet	200	20,000.00	4,000,000.00
6	Canteen	160	20,000.00	3,200,000.00
7	Guard house	6	20,000.00	120,000.00
8	Power house	20		400,000.00
9	parking	600	2,000	1,200,000.00
10	Green area	625	1,000	625,000.00
11	Fence	1,200		4,000,000.00
	<b>TOTAL</b>	<b>7,111</b>		<b>123,545,000.00</b>

## PROJECT PROFILE ON SOAP 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 <sup>2</sup>	Current lease price per M <sup>2</sup> (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 SOAP PRODUCTION

### 3.2.2. Machinery and equipment

The main plant and machinery consists fats and oils melting tank, plodder, transportation conveyor and etc. Major part of the machinery will be imported.

Table 10 Lists of Equipment Requirements for Soap manufacturing

S/No	Item description	Quantity	Total Amount
1	Bleaching equipment	1	85,000,000.00
2	Raw material preparation equipment	1	
3	Saponification equipment	1	
4	Drying equipment including transportation facility	1	
5	Finishing equipment including transportation facility	1	
6	Packing equipment including transportation facility	1	
7	Others auxiliary equipment	1	

### 3.2.3. Lists of machinery suppliers

#### ALIBABA

Hangzhou (Yuhang District)

969 West Wen Yi Road Yu Hang District, Hangzhou 311121

Zhejiang Province, China Tel: (+86) 571-8502-2088 Fax

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8376-8429

# PROJECT PROFILE ON SOAP PRODUCTION

## 4. Soap and detergent 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	45,000.00	540,000.00
2	executive secretary	1	15,000.00	180,000.00
3	Manager- admin. and finance	1	25,000.00	300,000.00
4	assistance manager- finance	1	20,000.00	240,000.00
5	accountant	1	15,000.00	180,000.00
6	cashier	1	10,000.00	120,000.00
7	personnel and general service	1	10,000.00	120,000.00
8	guards	5	3,000.00	180,000.00
9	driver ii	4	10,000.00	160,000.00
10	manager-production and technical	1	20,000.00	240,000.00
11	production clerk	1	4,000.00	48,000.00
12	chief quality controller	3	12,000.00	432,000.00
13	chief miller	1	10,000.00	120,000.00
14	machine operator	3	5,000.00	180,000.00
15	assistant machine operator	3	3,000.00	108,000.00
16	senior mechanics	3	12,000.00	432,000.00
17	senior electrician	3	12,000.00	432,000.00
18	store keeper	1	10,000.00	120,000.00
19	manager- commercial	1	20,000.00	240,000.00
20	purchaser	1	10,000.00	120,000.00
21	sales- manager	1	15,000.00	180,000.00
	total	38		4,672,000.00

### 5. Financial Analysis

#### 5.1. General

The financial analysis evaluation, under consideration has been carried out for soap production cost estimates of the envisaged factory 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, labour, 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, and 10 years' equal installments.
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 SOAP 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 3% of the sales revenue.
6. Maintenance and spare parts costs are 1.5% of the fixed investment costs.

### 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 <sup>2</sup>	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	7,111	lump sum	123,545,000.00	
	<b>Sub total</b>				<b>162,395,000.00</b>	
3	Machineries	set	1	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				259,895,000.00	
8	pre-operational expenses				2,000,000.00	
	Working capital				31,723,000.00	
	<b>TOTAL INVESTMENT COSTS</b>				<b>293,618,000.00</b>	

### 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.

As stated earlier even though 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 (about 124.925 million Birr) for purchase of machineries (about 130 million Birr), for purchase of truck and vehicles (about 6 million Birr), for working capital 50.99 million and for purchase of office furniture and pre operation expense which are 0.5million and 2 million respectively will be covered through bank loans that will have to be repaid back within 10 years, during which time interest will be paid on the loan. The remaining balance that of the total investment costs will be expected to be covered by equity contribution of the project promoter.

## PROJECT PROFILE ON SOAP PRODUCTION

### 5.5. Production costs

As it is depicted in Annex Table 18 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 are tallow, vegetable fat, caustic soda and packing materials etc. 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 237 million per annum.

Table 13 Raw materials input plan in Birr for soap production (for 9,615.40kg/day)

	Period				Start-up			Full Capacity
	Capacity utilization				70%	80%	90%	100%
	Project year				1	2	3	4
	Materials input for soap	Unit of measure	Quantity at full Capacity	Unit price				
1	LABSA	Kg	387,501	185	50,182	57,350	64,519	71,688
2	SODA ASH	kg	1,300,003	120	109,200	124,800	140,400	156,000
3	Filler	Kg	300,000	5	1,050	1,200	1,350	1,500
4	Silicate	kg	125,000	25	2,188	2,500	2,813	3,125
5	Salt	Kg	62,500	12	525	600	675	750
6	Water	kg	250,000	0.25	44	50	57	63
7	Carton	Pcs	250,000	15	2,625	3,000	3,375	3,750
8	Plaster	Roll	6,250	60	263	300	338	375
	<b>Total</b>				<b>166,077</b>	<b>189,800</b>	<b>213,527</b>	<b>237,251</b>

## PROJECT PROFILE ON SOAP 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 4.66million.

Table 14 Utilities of the factory'000''Birr

Utility''000''Birr		Start-up			Full Capacity
		70 %	80 %	90 %	
Capacity utilization		1	2	3	4
Project year		1	2	3	4
Item description	Unit of measurement				
<b>Fuel</b>					
Gasoline for service vehicle	100km*260days*37Birr/LIT*8km/Li	84.18	96.20	108.1	120.25
Gasoline for transport truck	(200km*300days*37Birr/LIT*5km/Li)*3	932	1,066	1,199	1,332
Sub-Total		<b>1016</b>	<b>1162</b>	<b>1307</b>	<b>1452</b>
Change of oil and lubricant	10% of the fuel consumption	<b>102</b>	<b>116</b>	<b>131</b>	<b>145</b>
Sub-Total		<b>1,118</b>	<b>1,278</b>	<b>1,438</b>	<b>1,597</b>
Electricity	260days*24 hrs*600kwh* 0.69Birr/kwh	1,808	2,066	2,325	2,583
Sub- Total		<b>1,808</b>	<b>2,066</b>	<b>2,325</b>	<b>2,583</b>
Water	365days*100m <sup>3</sup> /day*10 Birr/m <sup>3</sup>	255.50	292.00	328.50	365.00
Sub -Total		<b>255.50</b>	<b>292.00</b>	<b>328.50</b>	<b>365.00</b>
Telecommunication					
Telephone	5 lines* 500Birr/month/line+18Birr/line/month	31.08	31.08	31.08	31.08
Mobile	5 lines*500 Birr/month/line	30.00	30.00	30.00	30.00
Fax	2line*1,000Birr/month + 17 Birr/line/month	24.40	24.40	24.40	24.40
Internet	2,500 Birr/month	30.00	30.00	30.00	30.00
Sub-Total		<b>115.48</b>	<b>115.48</b>	<b>115.48</b>	<b>115.48</b>
<b>TOTAL</b>		<b>3,297.00</b>	<b>3,752.00</b>	<b>4,207.00</b>	<b>4,661.00</b>

### 5.5.3. Repair and maintenance

In the expenses under this title have been considered cost estimates required for annual repair and maintenance works including spare parts expenses. These costs include the annual repair expenses of structures and civil works as well as repair and maintenance expenses of machinery and equipment including accessory and general service facilities. The repair and maintenance and spare parts costs have been assumed to be (1.5% of fixed costs and spare part costs).

### 5.5.4. Salaries and wages

The costs of salaries have been calculated in accordance with the manning list proposed under the “organization and Management” section of this study. In the estimation of salaries and wages, the official minimum wage has been taken in to account. At full capacity operation the costs of salaries and wages will amount to Birr 4.67 Million.

### 5.5.5. 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 SOAP PRODUCTION

Table 15 Overhead costs

<b>Direct Overhead*000*Birr</b>		Year 1	Year 2	Year 3	Year 4
Annual land lease Payment		5,550.00	5,550.00	5,550.00	5,550.00
<b>Insurance</b>					
Building and Civil works	0.10%	124.92	124.92	124.92	124.92
Machinery and Equipment	0.20%	260	260	260	260
Motor vehicle and Truck	1%	60.00	60.00	60.00	60.00
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 800 Birr	78.40	78.40	78.40	78.40
Cleaning and sanitation	An estimate of 300 Birr/day	78.00	78.00	78.00	78.00
Sub Total		6,201.32	6,201.32	6,201.32	6,201.32
<b>Administration Overhead "000' Birr</b>					
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		<b>108.00</b>	<b>108.00</b>	<b>108.00</b>	<b>108.00</b>
GRAND TOTAL		<b>6,309.32</b>	<b>6,309.32</b>	<b>6,309.32</b>	<b>6,309.32</b>

### 5.5.6. 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.

## PROJECT PROFILE ON SOAP PRODUCTION

### 5.5.7. Depreciation

Depreciation charges should be taken in to account as part of the total production costs in order to calculate the total production costs, the net working capital and the gross or net-profit. For the given project under reference, the fixed assets and the pre-production capital expenditures have been depreciated and amortized respectively on “a straight line” depreciation method basis using the following rates of the original acquisition costs of the assets:

The rationale uses for the estimation of the depreciation and the amortization rates is based on the expected service life of the assets and repayment capacity of the project under consideration. Based on the above charging rates and consideration of the above facts, the total annual depreciation cost at full capacity operation have been estimated at Birr 21.32 million.

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	123,545,000.00	5% of original value	6,177.25	6,177.25	6,177.25	6,177.25
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	300.00	300.00	300.00	300.00
Motor vehicles and trucks	6,000,000.00	15 % of original value	900.00	900.00	900.00	900.00
Weighbridge	4,000,000.00	15 % of original value	600.00	600.00	600.00	600.00
Office equipment and furniture	500,000.00	20% of original value	100.00	100.00	100.00	100.00
Pre-operation expense	2,000,000.00	25% of original value	500.00	500.00	500.00	500.00
<b>Total</b>			<b>21,327</b>	<b>21,327</b>	<b>21,327</b>	<b>21,327</b>

## 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 = 306,250,000 Birr

Unit selling price = 1,750 Birr/carton

$$\text{BEP (sales)} = = \frac{\text{Annual sales} \times \text{Annual fixed costs}}{\text{Annual sales} - \text{Annual variables costs}} = = \frac{306,250,000 \times 55,944,000}{306,250,000 - 182,460,000}$$

BEP (Sales) = 138,402,537 Birr

#### B. BEP production

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

BEP production = 138,402,537/1,750 = 79,087 Carton

$$\begin{aligned} \text{c. BEP percentage} &= \frac{\text{Annual fixed costs} \times 100\%}{\text{Annual sales} - \text{Annual variables costs}} \\ &= \frac{55,944,000 \times 100\%}{306,250,000 - 182,460,000} \\ &= 45\% \end{aligned}$$

### 5.6.2. Return on investment

Return on investment = Net profit /Total capital requirement

$$= 412,500,000/293,618,000$$

$$= 140\%$$

The return on owners' investment (ROOI)

= Annual net profit /owners' investment

$$= 412,500,000/88,085,400$$

$$= 468\%$$

### 5.7. Project costs

Project capital investment costs are the sum of fixed capital investment (fixed investment plus pre-production capital expenses) and net working capital at full capacity, with fixed capital constituting the resources required for constructions and civil works, importation and installation of production machinery (soap and detergent machinery) and equipment and general service facilities, whereas, the working capital corresponding to the resources needed for operation of the project totally and partially.

As it has been revealed in Annex Table 18 the total annual operating costs excluding depreciation and interest are estimated to range from 193 million Birr in year 1 to 269 million Birr in year 4 and then after remain constant for the rest of the project life.

The total annual production costs including depreciation and interest increase from 238 million Birr in year 1 to 309.50 million Birr in year 4 then starts declining until it reaches 279 million Birr in year 10.

## PROJECT PROFILE ON SOAP PRODUCTION

### 5.8. Project benefits

For financial analysis and evaluation of the given project, the current material input price, and packing materials buying price and final packed soap and detergent price at the project gate has been taken as a basis. 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.

At full capacity operation the project is envisaged to have the following revenue components.

Table 17 Source of revenue in Birr"000"

	Period			Start-up			Full Capacity	
				70%	80%	90%	100%	100%
	Capacity utilization							
	Project year			1	2	3	4	5
	Product type		Unit price					
1	Bar Soap of 200gm , one carton contain 50 pcs of soap	Carton	1,750	306,250	330,000	371,250	412,500	412,500
	Total			306,250	330,000	371,250	412,500	412,500

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 412 million Birr per annum. The corresponding Annex Table 20 of "Net Income Statement" shows a steady growth of gross profit starting from 67.85 million Birr in year 1 reaching the peak of 133 million Birr in year 10. In its 10 years of manufacturing activities,

## PROJECT PROFILE ON SOAP PRODUCTION

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the project is expected to generate a total net profit of 678 million Birr and contribute 365 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 634 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 five 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 351 million Birr at 17%D.F. and the benefit-cost ratio of 1.25 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.

The project under study when implemented will have BEP at about 45% 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 SOAP PRODUCTION

### ANNEX II CALCULATION OF ANNUAL PRODUCTION COSTS

Table 18 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
Capacity utilization										
Cost category										
Material inputs	166,077	189,800	213,527	237,251	237,251	237,251	237,251	237,251	237,251	237,251
Labor	4,672	4,672	4,672	4,672	4,672	4,672	4,672	4,672	4,672	4,672
Utility	3,297	3,752	4,207	4,661	4,661	4,661	4,661	4,661	4,661	4,661
Repair and Maintenance and spare parts (1.5 % of fixed costs)	3,898	3,898	3,898	3,898	3,898	3,898	3,898	3,898	3,898	3,898
VI Direct overheads	6,201	6,201	6,201	6,201	6,201	6,201	6,201	6,201	6,201	6,201
<b>A. Direct Production costs</b>	184,145	208,323	232,505	256,683	256,683	256,683	256,683	256,683	256,683	256,683
VII. Administration over head	108	108	108	108	108	108	108	108	108	108
VIII. Marketing and Promotional expense 3 % of sales revenue	9,188	9,900	11,138	12,375	12,375	12,375	12,375	12,375	12,375	12,375
<b>B. Operating costs</b>	193,441	218,331	243,751	269,166	269,166	269,166	269,166	269,166	269,166	269,166
Interest	23,636	22,256	20,718	19,003	17,090	14,957	12,579	9,928	6,972	3,675
Depreciation	21,327	21,327	21,327	21,327	20,827	20,727	15,882	6,177	6,177	6,177
<b>C. Total production costs</b>	238,404	261,914	285,796	309,496	307,083	304,850	297,627	285,271	282,315	279,018

# PROJECT PROFILE ON SOAP PRODUCTION

## ANNEX IV

### CALCULATION OF WORKING CAPITAL REQUIREMENTS

- I. Minimum requirement of current assets and liabilities
  - A. Accounts receivable: 30 days at total production costs minus depreciation and interest
  - B. Inventory
    1. Material inputs: 30days
    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 : 90 days
  - D. Accounts payable 52 days for material inputs and utilities

ii. Working capital requirement

Table 19 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	19,344	21,833	24,375	26,917	26,917	26,917	26,917	26,917	26,917	26,917
B. Inventory												
1. Material inputs	26	10	16,608	18,980	21,353	23,725	23,725	23,725	23,725	23,725	23,725	23,725
2. Spare parts	90	4	975	975	975	975	975	975	975	975	975	975
3. Work under process	2	130	1,417	1,602	1,789	1,974	1,974	1,974	1,974	1,974	1,974	1,974
4. Product ready for delivery	8	32.5	5,774	6,518	7,262	8,006	8,006	8,006	8,006	8,006	8,006	8,006
C. Cash on hand			4,544	4,658	4,772	4,885	4,885	4,885	4,885	4,885	4,885	4,885
D. Current assets			48,661	54,566	60,524	66,482	66,482	66,482	66,482	66,482	66,482	66,482
II. Current liabilities												
A. A/p	26	10	16,937	19,355	21,773	24,191	24,191	24,191	24,191	24,191	24,191	24,191
III. Working capital												
A. Net working capital			31,723	35,211	38,751	42,290	42,290	42,290	42,290	42,290	42,290	42,290
B. Increasing in working capital			31,723	3,487	3,540	3,540	0	0	0	0	0	0

# PROJECT PROFILE ON SOAP 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	306,250	330,000	371,250	412,500	412,500	412,500	412,500	412,500	412,500	412,500
Less total production costs	238,404	261,914	285,796	309,496	307,083	304,850	297,627	285,271	282,315	279,018
Gross profit	67,846	68,086	85,454	103,004	105,417	107,650	114,873	127,229	130,185	133,482
Tax	23,746	23,830	29,909	36,051	36,896	37,678	40,206	44,530	45,565	46,719
Net profit	44,100	44,256	55,545	66,953	68,521	69,973	74,667	82,699	84,620	86,763
Accumulated undistributed profit	44,100	88,356	143,901	210,854	279,375	349,347	424,015	506,713	591,334	678,097

# PROJECT PROFILE ON SOAP 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	205,533									
2. Outstanding balance at end of year	205,533	193,534	180,156	165,239	148,607	130,062	109,385	86,329	60,622	31,959
a. First year loan										
Total										
A. Debt service										
1. First year Loan										
a. Interest	23,636	22,256	20,718	19,003	17,090	14,957	12,579	9,928	6,972	3,675
b. Repayment of principal	11,998	13,378	14,917	16,632	18,545	20,678	23,055	25,707	28,663	31,959

## PROJECT PROFILE ON SOAP 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	70%	80%	90%	100%						
Project year	1	2	3	4	5	6	7	8	9	10
Item description										
<b>A. Cash - inflow</b>	<b>616,806</b>	<b>335,905</b>	<b>377,208</b>	<b>418,458</b>	<b>412,500</b>	<b>412,500</b>	<b>412,500</b>	<b>412,500</b>	<b>412,500</b>	<b>412,500</b>
1. Financial resource (total)	310,556	5,905	5,958	5,958						
2. Sales revenue	306,250	330,000	371,250	412,500	412,500	412,500	412,500	412,500	412,500	412,500
<b>B. Cash – outflow</b>	<b>563,377</b>	<b>283,700</b>	<b>315,253</b>	<b>346,810</b>	<b>341,697</b>	<b>342,479</b>	<b>345,006</b>	<b>349,331</b>	<b>350,366</b>	<b>351,519</b>
1. Total assets schedule including replacement	310,556	5,905	5,958	5,958						
2. Operating costs	193,441	218,331	243,751	269,166	269,166	269,166	269,166	269,166	269,166	269,166
3. Debt service (total)										
a. Interest	23,636	22,256	20,718	19,003	17,090	14,957	12,579	9,928	6,972	3,675
b. Repayment	11,998	13,378	14,917	16,632	18,545	20,678	23,055	25,707	28,663	31,959
4. Tax	23,746	23,830	29,909	36,051	36,896	37,678	40,206	44,530	45,565	46,719
<b>C. Surplus (Deficit)</b>	<b>53,429</b>	<b>52,205</b>	<b>61,955</b>	<b>71,648</b>	<b>70,803</b>	<b>70,021</b>	<b>67,494</b>	<b>63,169</b>	<b>62,134</b>	<b>60,981</b>
<b>D. Cumulative cash balance</b>	<b>53,429</b>	<b>105,634</b>	<b>167,589</b>	<b>239,237</b>	<b>310,040</b>	<b>380,061</b>	<b>447,555</b>	<b>510,724</b>	<b>572,858</b>	<b>633,839</b>

# PROJECT PROFILE ON SOAP 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	259,895										
b. Replacement											
2. Pre-operational capital expenditure	2,000										
3. Working capital increase	31,723	3,487	3,540	3,540							
Total investment costs	293,618	3,487	3,540	3,540							

## 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	259,895											
❖ Cost of land												
d. Replacement												
2. Pre-operational capital expenditure	2,000											
3. Current assets increase	48,661	5,905	5,958	5,958								
Total assets	310,556	5,905	5,958	5,958								

## PROJECT PROFILE ON SOAP 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
Project year											
Sources of finance											
1. Equity capital	88,085	3,487	3,540	3,540							
2. Loan capital	205,532										
3. Current liabilities	16,937	2,418	2,418	2,418							
Total finance	310,554	5,905	5,958	5,958							

### 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	22%	21%	23%	25%	26%	26%	28%	31%	32%	32%
2. Net profit : Revenue	14%	13%	15%	16%	17%	17%	18%	20%	21%	21%
3. Net profit : initial investment	15%	15%	18%	22%	23%	23%	25%	27%	28%	29%
4. Net profit : Equity	50%	48%	58%	68%	69%	71%	76%	84%	86%	88%
5. Gross profit : Initial investment	23%	23%	28%	34%	35%	35%	38%	42%	43%	44%
6. Operating costs : Revenue	63%	66%	66%	65%	65%	65%	65%	65%	65%	65%

## PROJECT PROFILE ON SOAP PRODUCTION

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### 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	44,100	21,327	65,427	293,618	-228,191
2	44,256	21,327	65,583	3,487	-166,095
3	55,545	21,327	76,872	3,540	-92,763
4	66,953	21,327	88,280	3,540	-8,023
5	68,521	20,827	89,348	0.00	+81,325

## PROJECT PROFILE ON SOAP 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) <sup>n</sup> At 17%	Present value at 17%	Project costs			
				Total investment	Operating costs	Total	Present value at 17%
1	306,250	0.854701	261,752	293,618	193,441	487,059	416,290
2	330,000	0.730514	241,070	3,487	218,331	221,818	162,041
3	371,250	0.624371	231,798	3,540	243,751	247,291	154,401
4	412,500	0.53365	220,131	3,540	269,166	272,706	145,530
5	412,500	0.456111	188,146		269,166	269,166	122,770
6	412,500	0.389839	160,809		269,166	269,166	104,931
7	412,500	0.333195	137,443		269,166	269,166	89,685
8	412,500	0.284782	117,473		269,166	269,166	76,654
9	412,500	0.243404	100,404		269,166	269,166	65,516
10	412,500	0.208037	85,815		269,166	269,166	55,996
Total			1,744,839				1,393,814

A. Benefit- cost ratio At 17% D.F. = 1.25

B. NPV At 17% D.F. = 351,025,000 Birr