



PROJECT PROFILE ON PHARMACEUTICALS



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ADDIS ABEBA CITY ADMINISTRATION INVESTMENT COMMISSION
A.A

PROJECT PROFILE ON PHARMACEUTICALS

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I. Executive summary

This project profile is prepared to assess the viability of running Pharmaceutical drug manufacturing 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 Pharmaceutical drug manufacturing 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 only one private Pharmaceutical medicine manufacturing factory. According to the latest data sourced from Ethiopian investment commission (EIC) there are more about 102 companies registered to involve in production of Pharmaceuticals and related products. The status of these companies is: 54% on pre-implementation, 8% on implementation and 38% 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 factory at full capacity operation can produce 1,000,000kg, 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 541.90 million. Out of the total investment capital, the owners will cover Birr 162.58million (30 %) while the remaining balances amounting to Birr 379.34 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 2.9billion in the first year to Birr 4.12billion 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 39.45billion. 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 26.88 billion Birr at 17%D.F. and the benefit-cost ratio of 2.78 at 17% D.F.

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

1. BACKGROUND INFORMATION

1.1 Introduction

Pharmaceuticals play a vital role in maintaining the health of people and ensuring their productivity in all areas of life. In their effort to maintain a healthy way of life people invest a large proportion of their wealth to acquire effective pharmaceutical products manufacturers, distributors and retailers.

Basic pharmaceutical products are medicines considered essential for meeting the basic health needs of a community in the context of the health care standard of our country. The list of these essential medicines or popularly known as essential drugs are usually prepared by the Ministry of Health. In the importation of pharmaceutical products, priority is given to these essential drugs.

1.2 Product Description and Application

Medicines are chemicals or compounds used to cure, halt, or prevent disease; ease symptoms; or help in the diagnosis of illnesses. Advances in medicines have enabled doctors to cure many diseases and save lives. These days, medicines come from a variety of sources. Many were developed from substances found in nature, and even today many are extracted from plants.

Medicines act in a variety of ways. Some can cure an illness by killing or halting the spread of invading germs, such as bacteria and viruses. Others are used to treat cancer by killing cells as they divide or preventing them from multiplying. Some drugs replace missing substances or correct low levels of natural body chemicals such as some hormones or vitamins.

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

1.3.2 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

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

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

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

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

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

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

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

1.4. 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 braches of light manufacturing that Ethiopia prioritizes. As a result Addis Ababa completely dominates production in various subsectors. This can be taken as the political and social stability of the city.

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

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

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

1.4.1. The city benefit from the investment

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

- Employment opportunity

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

- Improving growth of the economy

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

1.5. Most Commonly Prescribed Pharmaceutical Drug in Ethiopia

Antibiotics are among the most commonly prescribed drugs in Ethiopian hospitals as in most developing countries (Desalegn, 2013; Gutema et al., 2018). Overall, 14 antibiotics agents constitutes the highest drug utilization, of which 13 were listed in Ethiopia's National Essential Medicines Lists (NEMs) (Gutema et al., 2018; Kebede et al., 2017).

1.6. Pharmaceutical in Ethiopia

The pharmaceutical industry of Ethiopia contributes only 15% of the total market share while 85% of pharmaceutical and medical supplies products are imported. According to Industrial Projects Studies (IPS) of pharmaceutical formulation study, the annual demand for the six essential drugs (Table, Capsules, Ampoules, Vials, Ointments and Syrups) is assumed to grow by 25%.

The existing industries produce only generic and similar drugs in small quantities. The National Essential Drug List shows the availability requirement of 300 drugs in the country. Only 90 of them are produced by the local manufacturers. However, there is no production of active pharmaceutical

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ingredients (API) in the country. Government and private clinics and hospitals in the country are coming up, and the demand for drugs and pharmaceutical products has increased. In order to meet this growing demand, a large amount of drugs are imported by different actors i.e. Ministry of Health, PHARMID, NGOs and Private importers.

Ethiopian pharmaceutical imports include products falling under Chapter HS No.30; Antibiotics, vaccines, penicillin, medicaments of other hormones, anesthetics medicament, medicaments of alkaloids or derivatives, vitamins, adhesive dressings for medical purposes, wadding, gauze, materials for surgical suture, absorbable hemostatic, blood-grouping reagents, dental cements and other dental fillings and first aid boxes and kits.

With the increasing demand for pharmaceutical products, Ethiopia needs Companies to set up a production unit. Most of the existing pharmaceutical and medical supplies manufacturing industries are confined in the capital, Addis Ababa.

1.7. Government support to the national pharmaceutical industry

Government support is important in the short to medium term to encourage growing pharmaceutical industries in developing countries to become competitive and to channel their growth in accordance with the objectives of health policy. The Ethiopian Government provided various kinds of support to the local pharmaceutical industry during the GTP-I period to promote import substitution, export growth, transfer of technology and job creation and to increase the production of essential medicines to improve access. Ethiopian Government procurement systems give preference to local pharmaceutical companies and offer advanced payment of up to 30% of the value of orders.

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Current incentives by the Ethiopian Government for local production include tax-free loans of up to 70% for new investments (so the investor needs to invest only 30% of the project capital at inception) and up to 60% for upgrading projects during the first five years. These loans are granted by the Development Bank of Ethiopia. There is also a 100% custom duty exemption on the import of all granted capital goods, such as manufacturing plant, machinery, equipment and construction materials.

Spare parts at up to 15% of the total value of imported investment capital goods are exempted from customs duty. Companies exporting 50% of their products or services, or supplying 75% of their products or services as production or services input to an exporter, are exempted from income tax for five years. Companies exporting less than 50% of their products or services or supplying only to the domestic market are exempted from income tax for two years. Investors that invest in high-priority areas to produce mainly export products are given land necessary for their investment at reduced lease rates. PFSA grants local manufacturers a 25% price preference and also pre-pays 30% of the tender value on awarding the contract; the 70% balance can be accessed through the Development Bank of Ethiopia if the local company requires additional capital and is willing to cede the tender to the bank. Product registration for local manufacturers is reduced to an average of one month. On their own, however, these incentives are not enough to spur development of the industry.

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 pharmaceutical Medicine

2.2.1 Local pharmaceutical Medicine Supply

According to Ethiopian Investment commission, there are 102 companies registered to involve in production of Pharmaceuticals and related products. The status of these companies is: 54% on pre-implementation, 8% on implementation and 38% on operation stages. Based on the data from CSA (2021) the amount of pharmaceuticals produced in the country with the classification of capsule, tablet, antibiotics, syrup and ointment is 397,485 tons. It is expected that the country production capacity will increase by 2.5 % with assumption that the companies with the implementation stage will enter into production of pharmaceuticals.

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2.2.2 Import

As it is shown in table 3 the import of pharmaceuticals showed increment from the year 2012 (690,162 kg) to 2015 (1,014,545 kg). Since then it has shown varying patterns. The average import value of pharmaceutical medicine from the year 2012 to 2021 was found to be 768,745 kg. Table 1 also shows forecast of future import of pharmaceuticals.

Table 1: Imported pharmaceutical drugs 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)	Imported per capital consumption based on total population
2012	690,162	619,566	2,198,924,829	123,081,499	4,249,136	237,839	0.007
2013	868,594	837,035	1,765,923,337	93,931,593	4,035,112	214,632	0.009
2014	1,014,545	977,023	2,309,686,687	114,661,068	4,126,293	204,844	0.010
2015	1,102,369	1,050,692	2,386,523,279	114,836,073	5,536,465	266,407	0.010
2016	474,665	458,208	882,650,199	40,866,273	2,443,177	113,118	0.004
2017	685,841	643,838	1,209,246,259	49,933,982	4,940,109	203,994	0.006
2018	551,667	538,392	918,267,852	33,186,406	4,318,739	156,080	0.005
2019	18,180	17,010	138,787,344	4,751,364	-	-	0.000
2020	1,163,359	1,122,171	3,058,515,578	87,511,175	8,220,729	235,214	0.010
2021	1,482,462	1,423,518	11,385,837,402	256,900,663	8,762,435	197,708	0.012
	Average	768,745					0.007

Sources: Ethiopian Revenue and customs Authority, compiled by consultant

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Table 2: Future forecast of import of pharmaceuticals by trend adjusted exponential smoothing method.

Year	Actual	Trend adjusted exponential smoothing
2012	619,566	
2013	837,035	
2014	977,023	
2015	1,050,692	
2016	458,208	
2017	643,838	
2018	538,392	
2019	17,010	
2020	1,122,171	
2021	1,423,518	
2022		1,423,518
2023		1,503,914
2024		1,584,309
2025		1,664,704
2026		1,745,099
2027		1,825,494
2028		1,905,890
2029		1,986,285
2030		2,066,680
2031		2,147,075

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Based on the above assumptions and manipulations, the supply of pharmaceuticals was projected and presented in table 3.

Table 3: Projected supply for pharmaceuticals in Ethiopia

Year	Projected local supply of pharmaceuticals (kg) will increase by 2.5%	Projected Import of pharmaceuticals (kg)	Total Projected supply pharmaceuticals in kg (local production + imported)
2022	44,196,870	1,423,518	45,620,388
2023	45,301,792	1,503,914	46,805,705
2024	46,434,337	1,584,309	48,018,645
2025	47,595,195	1,664,704	49,259,899
2026	48,785,075	1,745,099	50,530,174
2027	50,004,702	1,825,494	51,830,196
2028	51,254,819	1,905,890	53,160,709
2029	52,536,190	1,986,285	54,522,475
2030	53,849,595	2,066,680	55,916,275
2031	55,195,834	2,147,075	57,342,910

2.3 Pharmaceuticals Medicine Demand Projection

The demand for pharmaceuticals can be influenced by a number of factors. The size of population and its growth rate, burden of disease, rate of disease occurrence, prescribing traditions and guidelines, health seeking behavior, disposable income and prices are few among many variables. However, data on some of these parameters are not readily available in Ethiopia. Consequently, it is difficult if not possible to objectively quantify the actual demand. Nevertheless, for the purpose of this study, attempts have been made to forecast the likely future demand of pharmaceuticals on the basis of the following assumptions and presented in table 4.

- i. Ethiopia population is estimated to be 120,202,679 as of today (2022)

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ii. Annual growth of population is taken to be 2.5%

iii. Per capital consumption.

iv. Change of health seeking behavior of the people.

v. Per capital consumption = $\frac{\text{Effective demand}}{\text{Urban population}}$

vi. Effective demand = per capital consumption of domestic pharmaceutical drugs + Average per capital consumption of imported pharmaceutical drugs = 0.471kg + 0.007kg = 0.478 kg/person/year

Table 4: Projected demand for Pharmaceuticals in Ethiopia

Year	Ethiopian Population	Per capital consumption is estimated to be 0.478 and increased by 25% every year	Total estimated demand (kg)
2022	120,202,679	0.478	57,456,881
2023	123,207,746	0.598	73,616,628
2024	126,287,940	0.747	94,337,091
2025	129,445,138	0.934	120,901,759
2026	132,681,267	1.168	154,971,720
2027	135,998,298	1.460	198,557,515
2028	139,398,256	1.825	254,401,817
2029	142,883,212	2.281	325,916,607
2030	146,455,292	2.851	417,544,037
2031	150,116,675	3.564	535,015,830

As it is indicated above the demand for pharmaceutical drugs at 2022 is 57,456,881 kg. This volume will increase to 535,015,830 kg in the year 2031.

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2.4 Demand-Supply gap

As shown in table 5, the project will have unsatisfied demand for the coming 10 years' period. The projected demand will continue to be positive until 2031. 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 pharmaceutical drugs in Ethiopia. The unsatisfied demand for pharmaceutical drugs for the year 2031 estimated at 479,819,996 kg.

Table 5: Projected demand and supply gap analysis of pharmaceutical drugs.

Year	Projected demand (kg)	Projected local supply(kg)	Projected import (kg)	Unsatisfied demand (GAP) in kg)
2022	57,456,881	44,196,870	1,423,518	13,260,011
2023	73,616,628	45,301,792	1,503,914	28,314,836
2024	94,337,091	46,434,337	1,584,309	47,902,754
2025	120,901,759	47,595,195	1,664,704	73,306,564
2026	154,971,720	48,785,075	1,745,099	106,186,645
2027	198,557,515	50,004,702	1,825,494	148,552,813
2028	254,401,817	51,254,819	1,905,890	203,146,998
2029	325,916,607	52,536,190	1,986,285	273,380,417
2030	417,544,037	53,849,595	2,066,680	363,694,442
2031	535,015,830	55,195,834	2,147,075	479,819,996

3. Production Technology and engineering

3.1. Technology

3.1.1. Production process

The process involves following steps for various pharmaceuticals product.

i. TABLETS

Granulation: The raw material (various ingredients), viz the powder is sieved through a “sifter” so as to have the powder of equal mesh sizes after which, it is finely grind (through a Multi Mill) and mixed homogenously in a Mass- Mixer. This mass is then kept for drying (in a fluid bed dryer) for varying time and temperatures depending upon the quality of the product. The dried powder is ready to be converted in tablet form in the compression department.

Compression: The dried powder from the granulation department is fed through a hopper to a Rotary Tableting machine where it is compressed into tablets, which can be of different sizes depending upon the requirements. The process is carried out under controlled temperature, which is done by Air- conditioning.

Coating: This is an optional process depending on the customer’s requirement. At the same time it is also essential in order to maintain highest quality standards. In this process, the compressed tablets are coated (in a Tableting machine) with the help of a compressor. The tablets may be coated by sugar, material cellulose or any other material. Again the work area shall be Air-conditioned. The tablets are ready for packing (Figure 1).

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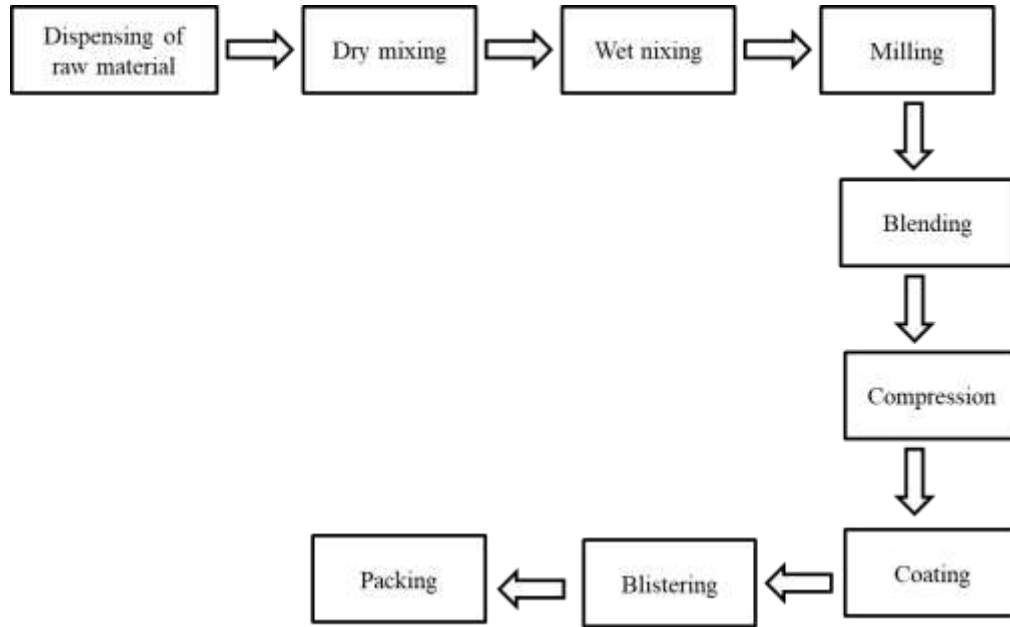


Figure 1 Process flow for tablet pharmaceuticals

ii. CAPSULES

The powder of various pharmaceutical raw materials is thoroughly mixed in a double cone blender for a fixed length of time. After mixing is complete, the powder is filled in empty capsules on a capsule filling machine which after fillings are closed and sealed. The capsules are then ready for packing.

iii. LIQUIDS

In preparing Liquid, utmost care is taken in purifying the water. The waters purified with the help of de-mineralizer plant. Only then it is used for manufacturing purposes. From the demineralizer the water is collected in a stainless steel tank. The necessary ingredients are added into it and mixed with the help of an electric stirrer. If suspensions are to be manufactured, then it is churned with the help of homogenizer. Further, they are also churned by Mill, which mixes the fine particles of water insoluble compound into an emulsion. After sometime, the stirred/churned liquid is passed through a volumetric filling machine into bottles/jar as required. The bottle is then sealed with the help of a sealing machine. It is then visually checked under light for any foreign particles in the syrup. After

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labeling the bottle is ready for dispatching. The bottles used in filling the liquids are thoroughly washed with the help of bottle washing machine and then dried in bottle dryer for sterilization. This is a very important process for the product to be of best quality (Figure 2).

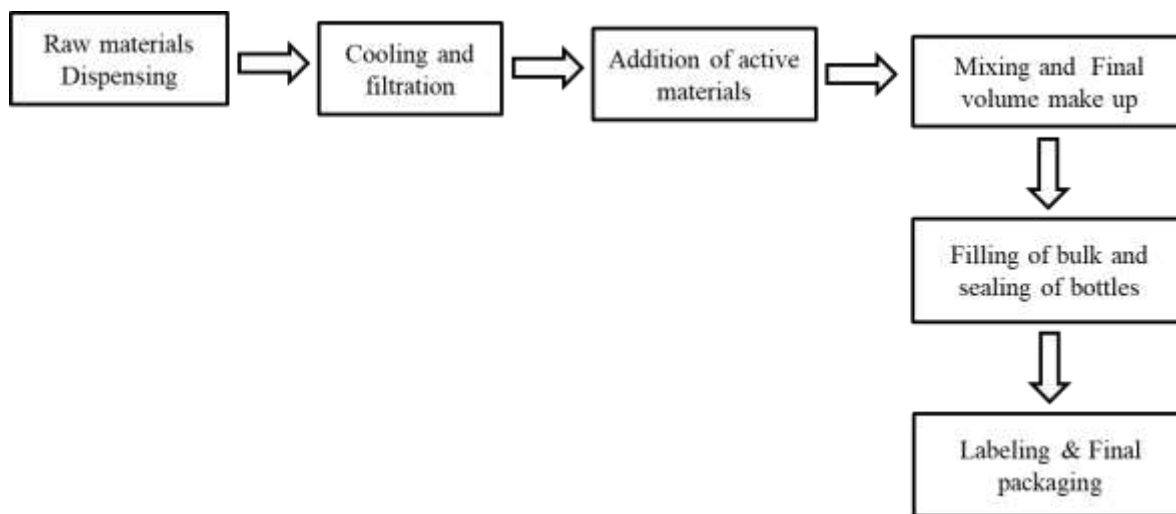


Figure 2 Process flow for liquid pharmaceuticals.

3.1.2. Environmental and Social Impact Assessment

Typically any developmental projects also trigger a set of environmental and social impacts. These environmental and social due to development projects occur in different forms. An Environmental and Social Impact Assessment (ESIA) has to be carried out to study the potential environmental and social impacts due to the production pharmaceutical medicines. Potential environmental and social impacts due to the production of pharmaceutical drugs 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

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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 process of Trimethoprim antibiotic

Pharmaceutical formulation is the process in which different chemical substances, including the active drug, are combined to produce a final medical product. Thus, they are various in products and characteristics. For the purpose this study, tablet form of pharmaceutical drug with the Trimethoprim and active ingredient based on United States Patent (US 8,349,366 B2) was considered.

Thus, based on the illustration given in the patent, the following recipe for the formulation of pharmaceutical medicine (antibiotic) containing Trimethoprim is presented in Table 6.

Table 6: Formulation recipe for Trimethoprim antibiotic

S./No.	Ingredients	Unit of Measurement		Unit Price		Total Price	
		%	kg	USD	ETB	USD	ETB
1	Trimethoprim	20%	200	25	1,325.00	5,000.00	265,000.00
2	Nihil Polyethyleneglycol 4000	24%	240	236	12,508.00	47,200.00	2,501,600.00
3	Surfactant: Sodium lauryl Sulfate, Cremophor R. RH40, and LutrolR) F127.	4%	40	4.49	238.06	898.33	47,611.70
4	Maltodextrin O1983	52%	520	3.5	185.50	700.00	37,100.00
	Sub total	100%	1,000.00			53,798.33 2	2,851,311.70
5	Packaging(10% of ingredients costs)						285,131.17
	Grand total						3,136,442.87

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3.1.4. 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 four year of its commencement.

3.1.5. Plant capacity

The annual production capacity of the plant in full capacity is 1,000,000 kg per year. The production capacity is based on projected demand and realistic market share that could be captured. The production commences two 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 raw materials is low.

Table 7: production plan for pharmaceutical medicine production

Period	Percentage of the product	Unit of measure	Start-up			Full Capacity	
Capacity utilization			70%	80%	90%	100%	100%
Project year			1	2	3		
Pharmaceutical drug (Trimethoprim: antibiotic)	100%	kg	700,000	800,000	900,000	1,000,000	1,000,000

3.2. Engineering

3.2.1. Land, buildings and civil works

The required area (m²) and construction cost for the production facilities essential for the successful operation of the processing plant is shown in Table 10. A total area ready for the processing plant is 10,000 m² out of which 5,670 m² is to be covered by building while uncovered area of 4,330m² is left storage of waste materials and future expansions. In order to estimate the land lease cost of the project profiles it is assumed that all the project will be located in different land level from level 1/1 to level 4/3, their current market lease price is from 39,073.31 birr per M² to 2,800.71 birr per M² respectively. Therefore, for the profile a land lease rate of birr 3,885 per M² have been taken, which is between the ranges.

The cost of construction of building should be appropriate to the size and expected profitability of business, costs of building generally differs by the type of construction materials used, the type of foundation, wall height and location. The current building cost for simple storage and processing room is from 10,000.00 Birr per m² to 25,000.00 Birr per m². The total construction cost of buildings and civil works, at a rate of Birr 20,000 per m² is estimated at Birr 113.10 million. Therefore, the total cost of land lease and construction of buildings and civil works is estimated at Birr 151.95 million.

The proposed plant layout comprises the following buildings and structures.

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Table 8 Building costs

S/No	Descriptions	Total area in M ²	Estimated cost per square meter (in Birr)	Total estimated cost (in Birr)
1	Raw materials receiving and store	2,000	20,000.00	40,000,000.00
2	Production room	150	20,000.00	3,000,000.00
3	Ingredients store	500	20,000.00	10,000,000.00
4	Filling and packing room	500	20,000.00	10,000,000.00
5	Packing materials store	500	20,000.00	10,000,000.00
6	Final products store	500	20,000.00	10,000,000.00
7	Finished products delivery veranda	100	20,000.00	2,000,000.00
8	Boiler room	100	20,000.00	2,000,000.00
9	workshop	120	20,000.00	2,400,000.00
10	Generator room	20	20,000.00	400,000.00
11	Power station room	20	20,000.00	400,000.00
12	Administration office 5,360=13,400,000	300	20,000.00	6,000,000.00
13	Production and technical office	200	20,000.00	4,000,000.00
14	Toilet and shower for female	40	20,000.00	800,000.00
15	Room for cloth changing for female	40	20,000.00	800,000.00
16	Toilet and shower for male	40	20,000.00	800,000.00
17	Room for cloth changing for male	40	20,000.00	800,000.00
18	parking	500	5,000.00	2,500,000.00
19	Fence	1,200 M*2	3,000.00	7,200,000.00
	TOTAL	5,670 M²		113,100,000.00

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Table 9 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 10 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

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3.2.2. Machinery and equipment

The main plant and machinery consists mixer, multi mill, tray dryer, Fluid bed dryers, Conical Mixer, Tablet Inspection Belt, Coating pan, Tablet Degusted, and etc. Major part of the machinery will be imported.

Table 11: Lists of machineries required for pharmaceutical drugs production

S/No.	Description	Quantity	Price, Birr (000 ²)
1	Mixer (250kg)	2	3,000,000.00
2	Multi mill (250kg)	2	4,000,000.00
3	Tray Dryers (96 Trays)	2	2,000,000.00
4	Fluid bed dryers (120 kg)	2	2,500,000.00
5	Conical Mixer (600 kg)	1	3,000,000.00
6	Table ting M/C	5	7,500,000.00
7	Tablet Inspection Belt	3	1,000,000.00
8	Coating pan	1	1,800,000.00
9	Sifter (20")	1	1,500,000.00
10	Tablet Degusted	5	1,500,000.00
11	Balance & Lab Equip.	set	5,000,000.00
12	Wastewater treatment plant	set	3,500,000.00
13	Solid waste incinerator	set	850,000.00
Sub Total			37,150,000.00
Contingency 15%			5,572,500.00
GRAND TOTAL			42,722,500.00

3.2.3. Lists of machinery suppliers

Shanghai Pharmaceutical Machinery Co.,Ltd

Tel

+86-21-33522115

Phone/Wechat/Whatsapp

+86 13482208428

E-mail

spm@spm.so

SPM Office Add

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SPM Factory Add

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ALIBABA

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4. Organizational structure

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

4.1. Manpower Requirement and Estimated Annual manpower costs

Table 12 Manpower requirements and annual costs

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

5. Financial Analysis

5.1. General

The financial analysis evaluation of Pharmaceutical medicine manufacturing 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

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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.
7. Furniture and fixture costs assumed to be 500,000.00

5.2. Initial Fixed investment costs

Table 13 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	5,670	lump sum	113,100,000.00	
	Sub total				151,950,000.00	
3	Machineries	set	2	Lump sum	42,722,500.00	
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				55,222,500.00	
	Fixed capital investment costs				207,172,500.00	
8	pre-operational expenses				2,000,000.00	
	Working capital				332,736,000.00	
	TOTAL INVESTMENT COSTS				541,908,500.00	

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. See Annex table 18 detail annual working capital calculation.

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 6) are Trimethoprim, Nihil Polyethyleneglycol 4000, surfactant 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 3.13billion per annum.

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.

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Table 14 Utilities of the factory'000''Birr

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

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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%	113.10	113.10	113.10	113.10
Machinery and Equipment	0.20%	94.50	94.50	94.50	94.50
Motor vehicle and Truck	1%	60	60	60	60
Vehicles annual inspection and registration	25,000 Birr per annum per vehicle	50.00	50.00	50.00	50.00
Work cloth	Two times per annum per workers at 1,000 Birr	140	140	140	140
Cleaning and sanitation	An estimate of 300 Birr/day	78.00	78.00	78.00	78.00
Sub Total		6,085.60	6,085.60	6,085.60	6,085.60
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		6,193.60	6,193.60	6,193.60	6,193.60

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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	113,100,000.00	5% of original value	5,655	5,655	5,655	5,655
Machinery and equipment	42,722,500.00	15 % of original value	6,408	6,408	6,408	6,408
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			14,463	14,463	14,463	14,463

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 = 7,000,000,000Birr

Unit selling price = 25 Birr/PCS

$$\text{BEP (sales)} = \frac{\text{Annual sales} \times \text{Annual fixed costs}}{\text{Annual sales} - \text{Annual variables costs}} = \frac{7,000,000,000 \times 69,148,000}{7,000,000,000 - 2,413,326,000}$$

BEP (Sales) = 105,530,936 Birr

B. BEP production

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

$$\text{BEP production} = 72,951,847/25 = 2,918,073$$

$$\begin{aligned} \text{c. BEP percentage} &= \frac{\text{Annual fixed costs} \times 100\%}{\text{Annual sales} - \text{Annual variables costs}} \\ &= \frac{69,148,000 \times 100\%}{7,000,000,000 - 2,413,326,000} \\ &= 15\% \end{aligned}$$

5.6.2. Return on investment

Return on investment = Net profit /Total capital requirement

$$= 2,936,394,000/541,908,500$$

$$= 542\%$$

The return on owners' investment (ROOI)

= Annual net profit /owners' investment

$$= 2,936,394,000/162,572,550$$

$$= 1806\%$$

5.7. Project benefits

For financial analysis and evaluation of the given project, the current raw price, and packing materials buying price and final packed processed pharmaceutical drug price at the project gate has been taken as a basis. Consequently, based on the recent market survey, price has been indicated in table 6.

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 10billion Birr per annum. The Net Income Statement shows a steady growth of gross profit starting from 2.9 billion Birr in year 1 reaching the peak of 4.2billion Birr in year 10. In its 10 years of manufacturing activities, the project is expected to generate a total

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net profit of 39.72 billion Birr and contribute 21.3billion 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 39.45 billion 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 one year 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 26.88billion Birr at 17%D.F. and the benefit-cost ratio of 2.78 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 15% 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 PHARMACEUTICALS

NNEX I

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	2,195,509	2,509,154	2,822,799	3,136,442	3,136,442	3,136,442	3,136,442	3,136,442	3,136,442	3,136,442
II. Labor	4,865	4,865	4,865	4,865	4,865	4,865	4,865	4,865	4,865	4,865
III. Utility	4,709	5,169	5,629	6,090	6,090	6,090	6,090	6,090	6,090	6,090
IV. Repair and Maintenance and spare parts (1.5 % of fixed costs)	3,108	3,108	3,108	3,108	3,108	3,108	3,108	3,108	3,108	3,108
VI Direct overheads	6,086	6,086	6,086	6,086	6,086	6,086	6,086	6,086	6,086	6,086
A. Direct Production costs	2,214,277	2,528,382	2,842,487	3,156,591	3,156,591	3,156,591	3,156,591	3,156,591	3,156,591	3,156,591
VII. Administration over head	108	108	108	108	108	108	108	108	108	108
VIII. Marketing and Promotional expense 3 % of sales revenue	210,000	240,000	270,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000
B. Operating costs	2,424,385	2,768,490	3,112,595	3,456,699	3,456,699	3,456,699	3,456,699	3,456,699	3,456,699	3,456,699
Interest	43,623	41,077	38,237	35,072	31,541	27,605	23,216	18,323	12,866	6,783
Depreciation	14,463	14,463	14,463	14,463	13,963	13,863	11,130	5,655	5,655	5,655
C. Total production costs	2,482,471	2,824,030	3,165,295	3,506,234	3,502,203	3,498,167	3,491,045	3,480,677	3,475,220	3,469,137

PROJECT PROFILE ON PHARMACEUTICALS

ANNEX II 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-icent of turnover	Project year									
			Start up			Full capacity						
			1	2	3	4	5	6	7	8	9	10
I. Current asset												
A. A/R	26	10	242,439	276,849	311,260	345,670	345,670	345,670	345,670	345,670	345,670	345,670
B. Inventory												
1. Material inputs	26	10	219,551	250,915	282,280	313,644	313,644	313,644	313,644	313,644	313,644	313,644
2. Spare parts	90	4	777	777	777	777	777	777	777	777	777	777
3. Work under process	2	130	17,033	19,449	21,865	24,281	24,281	24,281	24,281	24,281	24,281	24,281
4. Product ready for delivery	8	32.5	68,240	77,904	87,569	97,234	97,234	97,234	97,234	97,234	97,234	97,234
C. Cash on hand	90	4	4,719	4,834	4,949	5,064	5,064	5,064	5,064	5,064	5,064	5,064
D. Current assets			552,758	630,729	708,700	786,671	786,671	786,671	786,671	786,671	786,671	786,671
Current liabilities			220,022	251,432	282,843	314,253	314,253	314,253	314,253	314,253	314,253	314,253
A. A/p	26	10										
Working capital												
A. Net working capital			332,736	379,297	425,857	472,417	472,417	472,417	472,417	472,417	472,417	472,417
B. Increasing in working capital			332,736	46,560	46,560	46,560	0	0	0	0	0	0

PROJECT PROFILE ON PHARMACEUTICALS

ANNEX III

PROJECTED SALES REVENUE

Table 19 projected sales revenue '000'

Period	Capacity utilization	U/m	Quantity at full capacity	Unit price	Start up			Full capacity						
					70 %	80 %	90 %	100 %						
Item description	Product mix													
Project year					1	2	3	4	5	6	7	8	9	10
FLORFENICOL ANTIBIOTIC	One strip contain 10 pcs of 250 mg tablet	pcs	400,000,000	25	7,000,000	8,000,000	9,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
GRAND TOTAL					7,000,000	8,000,000	9,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000

PROJECT PROFILE ON PHARMACEUTICALS

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	7,000,000	8,000,000	9,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
Less total production costs	2,482,471	2,824,030	3,165,295	3,506,234	3,502,203	3,498,167	3,491,045	3,480,677	3,475,220	3,469,137
Gross profit	4,517,529	5,175,970	5,834,705	6,493,766	6,497,797	6,501,833	6,508,955	6,519,323	6,524,780	6,530,863
Tax	1,581,135	1,811,590	2,042,147	2,272,818	2,274,229	2,275,642	2,278,134	2,281,763	2,283,673	2,285,802
Net profit	2,936,394	3,364,381	3,792,558	4,220,948	4,223,568	4,226,191	4,230,821	4,237,560	4,241,107	4,245,061
Accumulated undistributed profit	2,936,394	6,300,774	10,093,333	14,314,281	18,537,849	22,764,040	26,994,861	31,232,421	35,473,528	39,718,589

PROJECT PROFILE ON PHARMACEUTICALS

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

Table 21 Debt services schedule and computation'000'

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	379,335	357,191	332,500	304,969	274,272	240,046	201,883	159,331	111,886	58,985
2. Outstanding balance at end of year										
a. First year loan	379,335	357,191	332,500	304,969	274,272	240,046	201,883	159,331	111,886	58,985
Total										
A. Debt service										
1. First year Loan										
a. Interest	43,623	41,077	38,237	35,072	31,541	27,605	23,216	18,323	12,866	6,783
b. Repayment of principal	22,144	24,681	27,531	30,697	34,227	38,163	42,551	47,445	52,901	58,985

PROJECT PROFILE ON PHARMACEUTICALS

ANNEX VIII CASH-FLOW STATEMENT FOR FINANCIAL PLANING

Table 22 Projected Cash flow statement

Period	Start up				Full capacity					
	70%	80%	90%	100%						
Project year	1	2	3	4	5	6	7	8	9	10
Item description										
A. Cash - inflow	7,761,931	8,077,971	9,077,971	10,077,971	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
1. Financial resource (total)	761,931	77,971	77,971	77,971						
2. Sales revenue	7,000,000	8,000,000	9,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
B. Cash – outflow	4,833,218	4,723,809	5,298,481	5,873,257	5,796,696	5,798,109	5,800,600	5,804,230	5,806,139	5,808,269
1. Total assets schedule including replacement	761,931	77,971	77,971	77,971						
2. Operating costs	2,424,385	2,768,490	3,112,595	3,456,699	3,456,699	3,456,699	3,456,699	3,456,699	3,456,699	3,456,699
3. Debt service (total)										
a. Interest	43,623	41,077	38,237	35,072	31,541	27,605	23,216	18,323	12,866	6,783
b. Repayment	22,144	24,681	27,531	30,697	34,227	38,163	42,551	47,445	52,901	58,985
4. Tax	1,581,135	1,811,590	2,042,147	2,272,818	2,274,229	2,275,642	2,278,134	2,281,763	2,283,673	2,285,802
C. Surplus (Deficit)	2,928,713	3,354,162	3,779,490	4,204,714	4,203,304	4,201,891	4,199,400	4,195,770	4,193,861	4,191,731
D. Cumulative cash balance	2,928,713	6,282,875	10,062,365	14,267,079	18,470,383	22,672,274	26,871,674	31,067,444	35,261,305	39,453,036

PROJECT PROFILE ON PHARMACEUTICALS

ANNEX XII TOTAL INVESTMENT COSTS

Table 23 Total investment costs”000”

Period	Start up			Full capacity							
Project year	1	2	3	4	5	6	7	8	9	10	11
Investment Category											
1. Fixed investment costs											
a. Initial fixed investment costs	207,173										
b. Replacement											
2. Pre-operational capital expenditure	2,000										
3. Working capital increase	332,736	46,560	46,560	46,560							
Total investment costs	541,909	46,560	46,560	46,560							

ANNEX XIII TOTAL ASSETS

Table 24 Total Assets

Period	Start up			Full capacity								
Project year	1	2	3	4	5	6	7	8	9	10	11	12
Investment Category												
1. Fixed investment costs												
c. Initial fixed investment costs	207,173											
❖ Cost of land												
d. Replacement												
2. Pre-operational capital expenditure	2,000											
3. Current assets increase	552,758	77,971	77,971	77,971								
Total Asset	761,931	77,971	77,971	77,971								

PROJECT PROFILE ON PHARMACEUTICALS

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	162,573	46,560	46,560	46,560							
2. Loan capital	379,336										
3. Current liabilities	220,022	31,410	31,411	31,410							
Total finance	761,931	77,970	77,971	77,970							

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 %										
Gross profit : Revenue	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%
Net profit : Revenue	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%
Net profit : initial investment	542%	572%	597%	619%	620%	620%	621%	622%	622%	623%
Net profit : Equity	1806%	1609%	1483%	1396%	1397%	1398%	1400%	1402%	1403%	1404%
Gross profit : Initial investment	834%	880%	919%	953%	953%	954%	955%	956%	957%	958%
Operating costs : Revenue	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%

PROJECT PROFILE ON PHARMACEUTICALS

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	2,936,394	14,463	2,950,857	541,909	+2,408,948

PROJECT PROFILE ON PHARMACEUTICALS

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	7,000,000	0.854701	5,982,907	541,909	2,424,385	2,966,294	2,535,294
2	8,000,000	0.730514	5,844,112	46,560	2,768,490	2,815,050	2,056,433
3	9,000,000	0.624371	5,619,339	46,560	3,112,595	3,159,155	1,972,485
4	10,000,000	0.53365	5,336,500	46,560	3,456,699	3,503,259	1,869,514
5	10,000,000	0.456111	4,561,110		3,456,699	3,456,699	1,576,638
6	10,000,000	0.389839	3,898,390		3,456,699	3,456,699	1,347,556
7	10,000,000	0.333195	3,331,950		3,456,699	3,456,699	1,151,755
8	10,000,000	0.284782	2,847,820		3,456,699	3,456,699	984,406
9	10,000,000	0.243404	2,434,040		3,456,699	3,456,699	841,374
10	10,000,000	0.208037	2,080,370		3,456,699	3,456,699	719,121
Total			41,936,538				15,054,577

A. Benefit- cost ratio at 17% D = 2.78

B. NPV at 17% D.F. = 26.88 billion