

Investment Office ANRS

**PROJECT PROFILE ON THE ESTABLISHMENT
OF PHARMACEUTICALS FORMULATING
PLANT**

Development Studies Associates (DSA)

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1. Executive Summary

This project proposes the establishment of pharmaceutical formulation plant with annual capacity of 700 mill pcs of tab. 130 mill capsule; 297000 liter syrup mill vials 79 mill ampoules & 32000 kg ointment at full capacity utilization.

The market study shows that there is sufficient market in the Amhara Region as well as in the country for the items.

The initial investment cost is planned to be Birr 151.9 million out of which about 74.6% is in foreign currency.

The plant will create employment opportunities for 580 people.

The finical internal rate of return (IRR) discounted at 18% is 26.4% and the net present value is Birr 27.2 million.

2. Product Description and Application

Drugs are one of those basic and essential products on which the health and welfare of a people depend on.

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.

Drugs can be classified on the basis of medicinal uses or on the basis of their sources of origin. Based on their medicinal use, drugs are classified into twenty-eight groups. On the other hand, drugs are classified into five groups based on their sources of origin. These are:

(a) Drugs of vegetable and plant origin, (b) Hormones and glandular products
(c) Antibiotics, (d) Synthetic drugs and (e) Vitamins and biological. The essential drugs are composed of the various groups of drugs just mentioned.

The products to be manufactured are identical on the basis of the product mixes of EPHARMECOR, which represented the essential drug lists for the local population. The categories of drug to be formulated include tablets, capsules, syrups, vials, ampoules and ointment.

Tablets are solid forms of the drug which include antibiotics, painkillers and vitamins. Their weight ranges from 25 to 500 mg.

Capsules are solid formulations with the powder drug enclosed in a gelatin shell. The shell which disintegrates after swallowing, serves to mask the taste of the active drug. Capsules are mostly antibiotics.

Syrups are liquid formulations to be administered orally. In addition to the active drug, flavoring agents are added to impart good taste. They are sold in 30-640 ml. bottles.

Vials are sterile antibiotic powder to be administered intravenously. They are administered after adding them to liquid medium (to form solutions or suspensions). These drugs are sold in 1-500 mg. dose filled vials.

Ampoules are sterile liquid antibiotics to be administered intravenously. They are used for injection and are mostly sold in 2 ml glass bottles.

Ointments are sterile semi-solid preparation for application to the eye and skin. They are sold in collapsible tubes.

3. Market Study, Plant Capacity and Production Program

3.1 Market Study

3.1.1 Present Demand and Supply

There is one old pharmaceutical formulation plant establishment in Addis Ababa in 1954¹ by foreigner and now called EPHARMECOR owned by the state. Latter on Addis Pharmaceutical Factory was established in 1988 in Adigrat town owned by the Tigray Regional state. These are the two main factories supplying part of the essential drug requirement of the country. In addition during the last ten years, some other pharmaceutical factories have been established in the Country, especially in Addis Ababa, this include East Africa, RX- Africa, Fews Pharma, Sino Ethiopia, Pharma Cure and ETAB Inter. and are producing some of essential drugs. Currently a relatively big pharmaceutical factory called Cadilla Pharma, is under construction in Debrezeit town.

There is no data available on the consumption patterns of hospitals or clinics that can be used to quantify the present consumption of pharmaceutical products. However, compared to the present population size and the mushrooming of both government and private clinics and hospitals in the country, it is prevalent that there is high shortage of drug and the prices are growing sky-high. To meet this growing demand, the country is forced to import these drugs in which case the annual expenditure on importing drugs is reaching over Birr 200 million.

Like other regions, the Amhara Region was getting its drugs requirements from the Addis Ababa factories and imports. Since the Amhara Region contains about 26 percent of the country's population, one could have expected that at least 25 percent of the local drugs are produced and consumed in the Region. But this is not the case. This consumption share is sufficient to absorb the production of a medium scale pharmaceutical factory in the Region.

In this regard the Amhara Region should promote the establishment of a pharmaceutical factory to make itself self-sufficient in the production of essential drugs.

¹ Years in this document are in Ethiopian calendar.

As shown on table 1 below, among the various medicines required for health care services, only six types were being produced in the country, which is not sufficient to cover the demand of the country. The Industrial Projects Studies (IPS) study of pharmaceutical formulation conducted in 1996 has indicated that the local production volume of pharmaceutical products is anticipated to cover only 35% of the country's requirement. Thus the deficit has to be augmented by imports every year.

On the other hand, the annual production of local drugs is not consistent, rather it is showing a declining trend. However, considering that the relatively big on-going pharmaceutical plant, Cadilla Pharma, will start production this year and increase the average local production by 15%, the current local supply is assumed to reach 733166 pieces of essential drugs.

Table 1
Domestic production of drugs between 2000 and 2004

Drug	Unit	1992	1993	1994	1995	1996	Ave
Capsules	1000pcs	273500	214800	268000	235000	173900	233000
Tablets	1000pcs	491300	451000	310400	434600	201300	377700
Antibiotics	1000pcs	29600	32200	5700	7200	-	14900
Syrup	100ltr	232	258	419	668	24680	5300
Ointment	Tons	54	59	30	37	-	36
Injection 100	1000pcs	6295	4933	2614	18944	214	6600
Total		800981	703250	587163	696449	400094	637536

Source: Project Idea made by DPS.

Since the existing local pharmaceutical formulation plants are expected to cover about 35 % of the country's demand, the balance is met through imports by different actors i.e. Ministry of Health, PHARMID, NGOs and Private importers. As to the volume and value of imports, it was tried to see from the Customs Authority's External Trade Statistical Bulletins between the years 1989 and 1999. However, imports of essential drugs i.e. ampoules, capsules, Tablets, syrups, vials and Ointments are appeared only in the year 1999 as shown below on table 2.

Table 2
Imports of Drugs between 1996 and 20007

Pharmaceutical Drugs	Values in Birr	Weight in Kg.
Table	8,919,598	65,549
Capsules	1,927,939	12,748
Ampoules	23,374,304	134,523
Vials	1,367,769	57,707
Ointments	3,529,678	38,190
Syrups	457,987	11,058
Average	6,596,122	53,292

Source: Customs Authority, 1996-2007

3.1.2 Projected Demand

There is no data available on the consumption patterns of hospitals or clinics that can be used to quantify the present consumption of pharmaceutical products. However it is assumed that the consumption of drugs grows with the population increase as with all other commodities. Of course, with the increase of population the health facilities should increase to help the people and the usage of drugs will then show a parallel increase. 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%.

There is no other data available to be used in projecting the demand of pharmaceutical products. Hence, the demand projection made on the basis of IPS's forecast figure of 1996 on six items taking the average annual increase of 25% is indicated on Tables 3 below.

Table 3
IPS's Forecasts of Local Demand

Pharmaceutical Drugs	Forecasted Production in "000" units		
	1989	1993	1998
Table (100 tablet boxes)	14,305	34,925	106,581
Capsules (1000 capsules boxes)	4,339	10,594	32,330
Ampoules (100 ampoules boxes)	2,527	5,170	18,829
Vials (100 vial boxes)	2,027	4,948	15,099
Ointments(1g.tins)	3,099	7,567	23,093
Syrups (bottles of different size)	4,339	10,594	32,330

Based on this assumption, the present demand will be as follows:

- Tablets 166,532,000 (100 tablet boxes)
- Capsules 50,515,000 (1000 capsules boxes)
- Ampoules 29,420,000 (100 ampoules boxes)
- Vials 23,592,000 (100 vial boxes)
- Ointments 36,082,000 (1g.tins)
- Syrups 50,515,000 (bottles of different size)

The project of demand for pharmaceutical products for the next ten years is shown in Table 4.

Table 4
PROJECTION OF DEMAND OF ESSENTIAL DRUGS

In "000" units

Essential Drugs	Year										
	2000	2001	2001	2003	2004	2005	2006	2007	2008	2009	2010
Tablets (1000 tablets boxes)	166,532	208165	260206	325258	406572	508215	635269	794086	992608	1240760	1550950
Capsules (1000 capsules boxes)	50,515	63144	78930	98662	123328	154160	192699	240874	301093	376366	470458
Ampoules (1000 ampoules boxes)	29,420	36775	45969	57461	71826	89783	112228	140285	175357	219196	273995
Vials (100 vial boxes)	23,592	29490	36863	46078	57598	71997	89996	112495	140619	175774	219718
Ointments (1kg.tins)	36,082	45103	56378	70473	88091	110114	137642	172052	215065	268832	336040
Syrups (bottles of diff. size)	50,515	63144	78930	98662	123328	154160	192699	240874	301093	376366	470458

The demand of pharmaceutical products is estimated to grow from 2000 to 2010 as demonstrated above on Table 3 for six categories of products.

3.1.3 Pricing and Distribution

To list the entire price for all tablets, capsulate, ampoule, vials, ointment and syrups will be too cumbersome. Hence, samples are taken from each group and the average price of this sample is taken for each group.

- a) Tablets- the average price is taken to be Birr 0.15/ tab.
- b) Capsules- the average price is taken to be Birr 0.30/cap.
- c) Ampoules- the average price is taken to be Birr 1.50/ampoule.
- d) Vials- the average price is taken to be Birr 3.50/vial.
- e) Ointments- the average price is taken to be Birr 4.00/20mg.
- f) Syrup- the average price is taken to be Birr 6.00/bottle.

For simplicity, the above six drugs are again regrouped in to three with their respective average price i.e

- a) Price of tablets and capsules: Birr 0.30
- b) Price of ampoules and vials: Birr 2.75
- c) Price of ointment and syrups: Birr 5.00

It would be necessary to make marketing promotion attempt to attract the wholesalers and retailer of pharmaceutical products so as use their channel of distribution. In the long run, it is important to make market research in the neighboring countries to export the products.

3.1.4 Plant Capacity

The economic capacity of the formulation plant and product mix, in terms of the maximum rated output of the individual products, is assumed as follows:-

Tablets:	700 million tabs/year
Capsules:	130 million caps/year
Vials:	5 million vials/year
Ampoules:	19 million ampoules/year
Ointment:	32,000 kg/year
Syrup:	297,000 syrups/year

3.2 Production Program

The formulation of the above products will be imitated simultaneously with 60%, 80% and 100% capacity utilization during the first ,second and third year of operation, respectively. The plant will be run for 275 days annually in a single shift. The low capacity utilization level during the initial period of project operation is due to the fat that pharmaceutical projects are relatively complex in terms of meeting quality standards, and therefore it would take long time to develop operational skill.

Annual over-haul is expected to take about one month, resulting in net available working days of 245.

4. Raw Materials and Utilities

4.1 Availability and Source of Raw Materials

The chemical industry is the basis for the development of a pharmaceutical industry. In the absence of a well- developed chemical industry, the alternative to operate a pharmaceutical factory is to import the various inputs from abroad.

4.2 Annual Requirement and Cost of Raw Materials and Utilities

The raw materials for the formulation plant are bulk drugs, which have to be imported. Total annual cost is estimated at Birr 225.0 million, of which about 11.2 million is in local currency.

The auxiliary materials constitute a variety of packing materials. They include glass bottles, plaster bottles, rubber stoppers, plastic caps, cartons for outer packaging etc. Total annual cost is estimated at Birr 27 million, of which the foreign component is about 25%.

The utilities required are:-

- Water at the rate of 200,000 liters per day
- Electric power, 1123 kw
- Steam, at the rate of 2.7 tones per hour

Total utility cost is estimated at Birr 1,000,000

The unit cost, annual quantity and cost of raw materials and utilities at full production capacity is shown in Table 5.

Table 5
RAW MATERIAL REQUIREMENTS

Item	Unit cost ('000 Birr/tonne)		Annual Quantity (Tones)	Annual Cost (000 Birr)		
	FC	L.C		FC	LC	TC
	Bulk Drug	420.72		22.14	508	213,756
Auxiliaries				20,250	6,750	27,000
Sub total				234,006	17,997	252,003
Utilities					1,000	1,000
Total				234,006	18,997	253,003

5. Location and Site

The ideal location for pharmaceuticals formulation plant is Bahir Dar, Goandar or Dessie towns.

6. Technology and Engineering

6.1 *Production Process*

The manufacturing processes of drugs differ on the basis of their sources of origin or medium use. Different approaches of formulations and manufacturing are used for different groups of drugs.

Basically, the formulation process involves the blending of the different bulk drug constituents in pre-determined proportions. The production of solid drugs, such as tablets, involves mixing/milling, drying and table ting. The manufacturing operations of capsules include powder mixture preparation, filling of powder into gelatin capsule and sealing. A liquid formulation such as syrup involves basically mixing and filling. The manufacture of sterile drugs like vials and ampoules includes, in addition to basic formulation operations, sterilization process.

Alternatively, the interested investor can add animal drugs production by careful assessment of the market.

6.2 *Machinery and Equipment*

The list of production machinery and equipment are presented in Tables 6.1 to Table 6.6. The total estimated cost of the machinery and equipment is about Birr 15.0 million, of which about 25 is in local currency.

Table 6.1
TABLET PRODUCTION

Type of M/C and Equipment	Quantity
- Mixer (250kg)	2
- Multi mill(250 kg)	2
- Tray Dryers (96 Trays)	2
- Fluid bed dryers (120 kg)	2
- Conical Mixer (600 kg)	1
- Table ting M/C	5
- Tablet Inspection Belt	3
- Coating pan	1
- Sifter (20")	1
- Tablet Degusted	5
- Balance & Lab Equip.	set

Table 6.2
CAPSULE PRODUCTION

Type of M/C and Equipment	Quantity
- Paddle mixer	2
- Fritz mill	2
- Tray dryer	1
- Sifter	1
- Filling of sealing m/c	3
- Sorting/polishing m/c	2
- Balances	SET

Table 6.3
PACKING (FOR TABLET AND CAPSULE)

Type of M/C and Equipment	Quantity
- Counter and Filler	2
- Packing conveyer	4
- Turn Table	1
- Strip Packing	4
- Defiler	2
- Carton coding	2

Table 6.4
OINTMENT

Type of M/C and Equipment	Quantity
- Wax Melting Vessel	2
- Ointment Mixing Vessel	2
- Triple Roll Mill	2
- Ointment Filling/crimping	1
- Laminar Flow	1
- Steam Sterilizer	1
- Dry heat sterilizer	1
- Stat Conveyor	1

Table 6.5
SYRUP

Type of M/C and Equipment	Quantity
Hoist	1
Sugar loader	1
Syrup mixing vessel	2
Manufacturing vessel	2
Staging vessel	2
Filter press	2
Colloid mill	1
Bottle washing, drying, filling, labeling line	1

Table 6.6
AMPOULES AND VIALS

Type of M/C and Equipment	Quantity
Counter and filler	2
Packing conveyor	4
Turn table	1
Strip packing machine	4
Defiler	2
Carton loading	2

Machinery supplier can be reached through the following address:

[Charles Ross & Son Co.](#) [E-mail this company](#)

710 Old Willets Path

Hauppauge, NY 11788

Phone: 631-234-0500, 800-243-ROSS (toll free)

Fax: 631-234-0691

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6.3 Civil Engineering Cost

The breakdowns of the estimated areas of the building are as follows:

Production building:	4760 square meters
Office building:	1285 “ “
Store and other	<u>6300</u> “ “
	<u>12345</u>

Total building cost is estimated at Birr 20 million of which about 40% is in foreign exchange. The total land requirement of the project including provision for space is estimated to be 16,000 square meters.

7. Human Resource and Training Requirement

7.1 Human Resource

The total manpower requirement is 580, of which about 330 persons are skilled and the remaining are unskilled. The total manpower cost is estimated at Birr 6.4 million per year.

Table 7
PHARMACEUTICAL FORMULATION
MANPOWER REQUIREMENT

Category	Number	Monthly Salary/person (Birr)	Annual Salary (Birr)
1. Manager	1	5,000	60,000
2. Skilled worker			
2.1 Supervisor	6	3500	252,000
2.2 pharmacist	12	3000	432,000
2.3 Chemist	6	2000	144,000
2.4 Technician	5	1000	60,000
2.5 Operators	300	800	2,880,000
3. Unskilled workers (laborers)	250	500	1,500,000
Total	580		5,328,000
Benefits (20%)			1,065,600
Total			6,393,600

7.2 Training Requirement

Foreign training is proposed for key technical personnel. It is envisaged that:

- Two persons shall be trained for one month in the area of manufacturing.
- One man be trained for one month in quality control
- Two men be trained for one month in maintenance

Training cost is estimated at Birr 200,000. In addition, about Birr 4 million will be required for know how transfer. About Birr 150,000 of the training cost will be in foreign currency.

8. Financial Analysis

8.1 Underlying Assumption

The financial analysis of pharmaceuticals formulating plant is based on the data provided in the preceding chapters and the following assumptions.

A. Construction and Finance

Construction period	2 year
Source of finance	40% equity and 60% loan
Tax holidays	3 years
Bank interest rate	12%
Discount for cash flow	18%
Value of land	Based on lease rate of ANRS
Spare Parts, Repair & Maintenance	3% of fixed investment

B. Depreciation

Building	5%
Machinery and equipment	10%
Office furniture	10%
Vehicles	20%
Pre-production (amortization)	20%

C. Working Capital (Minimum Days of Coverage)

Raw Material-Local	30 days
Raw Material-Foreign	120 days
Factory Supplies in Stock	30 days
Spare Parts in Stock and Maintenance	30 days
Work in Progress	10 days
Finished Products	15 days
Accounts Receivable	30 days
Cash in Hand	30 days
Accounts Payable	30 days

8.2 Investment

The total investment cost of the project including working capital is estimated at Birr 152 million as shown in table 8 below. The Owner shall contribute 40% of the finance in the form of equity while the remaining 60% is to be financed by bank loan.

Table 8: Total initial investment

	LC	FC	Total
Land	48,000		48,000
Building	8,000,000	12,000,000	20,000,000
Office equipment	40,000		40,000
Vehicles	250,000		250,000
machinery & equipment	3,750,000	11,250,000	15,000,000
Total Fixed Investment	12,088,000	11,250,000	35,338,000
Pre production	1,766,900		1,766,900
Total Initial Investment	13,854,900	11,250,000	37,104,900
Working capital	24,720,815	102,111,709	126,832,524
Total	38,575,715	113,361,709	151,937,424

Pre-production capital expenditure includes - all expenses for pre-investment studies, consultancy fee during construction and expenses for company's establishment, project administration expenses, commission expenses, preproduction marketing and interest expenses during construction.

The foreign component of the project accounts for Birr 113.4 million or 74.6% of the total investment cost.

8.3 Production Costs

The total production cost of the project at full capacity utilization is about Birr 273.2 million of which 91.6% is cost of raw materials (table 9).

Table 9

Total Production Cost at full Capacity	
Items	Cost
1. Raw materials	252,003,000
2. Utilities	1,000,000
3. Wages and Salaries	6,393,600
4. Spares and Maintenance	1,060,140
<i>Factory costs</i>	<i>260,456,740</i>
5. Depreciation	2,907,380
6. Financial costs	9,836,245
Total Production Cost	273,200,365

8.4 Financial Evaluation

I. Profitability

According to the projected income statement, the project will generate profit beginning from first year of operation. Important ratios such as net profit to equity (Return on equity) and net profit and interest on total investment (return on total investment) are 10% and 26.%, respectively in the first year and are gradually rising. The income statement and other profitability indicators show that the project is viable

II. Breakeven Analysis

The breakeven point of the project is estimated by using income statement projection. Accordingly the project will breakeven at 10.2% of capacity utilization.

III. Payback Period

Investment cost and income statement projection are used in estimating the project payback period. The project will payback fully the initial investment less working capital in two years time.

IV. Simple Rate of Return

It is a ratio of net profit and interest to the total capital invested for a single year at full capacity operation. Thus the SRR of the project is calculated to be 23.0%

V. Internal Rate of Return and Net Present Value

Based on the projected cash flow statement, the calculated IRR of the project is 26.4% and the net present value (NPV) is Birr 27.2 million.

VI. Sensitivity Analysis

The financial viability of the spices processing plant will not be affected if prices of raw materials are increased by 10%.

9. Economic and Social Benefit and Justification

Based on the foregoing presentation and analysis, we can learn that the proposed project possesses wide range of benefits that complement the financial feasibility obtained earlier. In general the envisaged project promotes the socio-economic goals and objectives stated in the strategic plan of the Amhara National Regional State, promote technology transfer and make the Region self sufficient in essential drugs production. These benefits are listed as follows

A. Profit Generation

The project is found to be financially viable and earns on average a profit of birr 28.63 million per year and birr 286.1 million within the project life. Such result induces the project promoters to reinvest the profit which, therefore, increases the investment magnitude in the region.

B. Tax Revenue

In the project life under consideration, the region will collect about birr 114.9 million from corporate tax payment alone (i.e. excluding income tax, sales tax and VAT). Such result create additional fund for the regional government that will be used in expanding social and other basic services in the region

C. Import Substitution and Foreign Exchange Saving

As there is no local production of milk powder in the country, the commencement of this project relieves a portion of the import burden. That is, based on the projected figure we learn that in the project life an estimated amount of US Dollar 316.6 million will be saved as a result of the proposed project. This will create room for the saved hard currency to be allocated on other vital and strategic sectors

D. Employment and Income Generation

The proposed project is expected to create employment opportunity to several citizens of the country. That is, it will provide permanent employment to 580 professionals as well as support stuffs. Consequently the project creates income of birr 6.4 million per year. This would be one of the commendable accomplishments of the project.

E. Pro Environment Project

The proposed production process is environment friendly.

ANNEXES

Annex 1: Total Net Working Capital Requirements (in Birr)

	CONSTRUCTION		PRODUCTION			
	Year 1	Year 2	1	2	3	4
Capacity Utilization (%)	0.00	0.00	60%	70%	80%	90%
1. Total Inventory	0.00	0.00	138060580.66	161070677.44	184080774.21	207090870.99
Raw Materials in Stock- Total	0.00	0.00	62445010.91	72852512.73	83260014.55	93667516.36
Raw Material-Local	0.00	0.00	1177985.45	1374316.36	1570647.27	1766978.18
Raw Material-Foreign	0.00	0.00	61267025.45	71478196.36	81689367.27	91900538.18
Factory Supplies in Stock	0.00	0.00	172383.79	201114.42	229845.05	258575.68
Spare Parts in Stock and Maintenance	0.00	0.00	69390.98	80956.15	92521.31	104086.47
Work in Progress	0.00	0.00	4309594.69	5027860.47	5746126.25	6464392.04
Finished Products	0.00	0.00	8619189.38	10055720.95	11492252.51	12928784.07
2. Accounts Receivable	0.00	0.00	20725854.55	24180163.64	27634472.73	31088781.82
3. Cash in Hand	0.00	0.00	483944.73	564602.18	645259.64	725917.09
CURRENT ASSETS	0.00	0.00	96825369.02	112962930.53	129100492.03	145238053.54
4. Current Liabilities	0.00	0.00	20725854.55	24180163.64	27634472.73	31088781.82
Accounts Payable	0.00	0.00	20725854.55	24180163.64	27634472.73	31088781.82
TOTAL NET WORKING CAPITAL REQUIRMENTS	0.00	0.00	76099514.48	88782766.89	101466019.30	114149271.72
INCREASE IN NET WORKING CAPITAL	0.00	0.00	76099514.48	12683252.41	12683252.41	12683252.41

Annex 1: Total Net Working Capital Requirements (in Birr) (continued)

	PRODUCTION					
	5	6	7	8	9	10
Capacity Utilization (%)	100%	100%	100%	100%	100%	100%
1. Total Inventory	230100967.77	230100967.77	230100967.77	230100967.77	230100967.77	230100967.77
Raw Materials in Stock-Total	104075018.18	104075018.18	104075018.18	104075018.18	104075018.18	104075018.18
Raw Material-Local	1963309.09	1963309.09	1963309.09	1963309.09	1963309.09	1963309.09
Raw Material-Foreign	102111709.09	102111709.09	102111709.09	102111709.09	102111709.09	102111709.09
Factory Supplies in Stock	287306.31	287306.31	287306.31	287306.31	287306.31	287306.31
Spare Parts in Stock and Maintenance	115651.64	115651.64	115651.64	115651.64	115651.64	115651.64
Work in Progress	7182657.82	7182657.82	7182657.82	7182657.82	7182657.82	7182657.82
Finished Products	14365315.64	14365315.64	14365315.64	14365315.64	14365315.64	14365315.64
2. Accounts Receivable	34543090.91	34543090.91	34543090.91	34543090.91	34543090.91	34543090.91
3. Cash in Hand	806574.55	806574.55	806574.55	806574.55	806574.55	806574.55
CURRENT ASSETS	161375615.04	161375615.04	161375615.04	161375615.04	161375615.04	161375615.04
4. Current Liabilities	34543090.91	34543090.91	34543090.91	34543090.91	34543090.91	34543090.91
Accounts Payable	34543090.91	34543090.91	34543090.91	34543090.91	34543090.91	34543090.91
TOTAL NET WORKING CAPITAL REQUIRMENTS	126832524.13	126832524.13	126832524.13	126832524.13	126832524.13	126832524.13
INCREASE IN NET WORKING CAPITAL	12683252.41	0.00	0.00	0.00	0.00	0.00

Annex 2: Cash Flow Statement (in Birr)						
	CONSTRUCTION		PRODUCTION			
	Year 1	Year 2	1	2	3	4
TOTAL CASH INFLOW	18552450.00	145384974.13	210712854.55	225105809.09	256770309.09	288434809.09
1. Inflow Funds	18552450.00	145384974.13	20725854.55	3454309.09	3454309.09	3454309.09
Total Equity	7420980.00	58153989.65	0.00	0.00	0.00	0.00
Total Long Term Loan	11131470.00	87230984.48	0.00	0.00	0.00	0.00
Total Short Term Finances	0.00	0.00	20725854.55	3454309.09	3454309.09	3454309.09
2. Inflow Operation	0.00	0.00	189987000.00	221651500.00	253316000.00	284980500.00
Sales Revenue	0.00	0.00	189987000.00	221651500.00	253316000.00	284980500.00
Interest on Securities	0.00	0.00	0.00	0.00	0.00	0.00
3. Other Income	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL CASH OUTFLOW	18552450.00	18552450.00	277644688.72	228132147.29	261539522.80	288003915.32
4. Increase In Fixed Assets	18552450.00	18552450.00	0.00	0.00	0.00	0.00
Fixed Investments	17669000.00	17669000.00	0.00	0.00	0.00	0.00
Pre-production Expenditures	883450.00	883450.00	0.00	0.00	0.00	0.00
5. Increase in Current Assets	0.00	0.00	96825369.02	16137561.50	16137561.50	16137561.50
6. Operating Costs	0.00	0.00	157594324.72	183797348.84	210000372.96	236203397.08
7. Corporate Tax Paid	0.00	0.00	0.00	0.00	9171600.48	11400217.97
8. Interest Paid	0.00	0.00	23224994.97	11803494.54	9836245.45	7868996.36
9. Loan Repayments	0.00	0.00	0.00	16393742.41	16393742.41	16393742.41
10. Dividends Paid	0.00	0.00	0.00	0.00	0.00	0.00
Surplus(Deficit)	0.00	126832524.13	-66931834.17	-3026338.20	-4769213.71	430893.77
Cumulative Cash Balance	0.00	126832524.13	59900689.96	56874351.75	52105138.04	52536031.81

Annex 2: Cash Flow Statement (in Birr): Continued						
	PRODUCTION					
	5	6	7	8	9	10
TOTAL CASH INFLOW	320099309.09	316645000.00	316645000.00	316645000.00	316645000.00	316645000.00
1. Inflow Funds	3454309.09	0.00	0.00	0.00	0.00	0.00
Total Equity	0.00	0.00	0.00	0.00	0.00	0.00
Total Long Term Loan	0.00	0.00	0.00	0.00	0.00	0.00
Total Short Term Finances	3454309.09	0.00	0.00	0.00	0.00	0.00
2. Inflow Operation	316645000.00	316645000.00	316645000.00	316645000.00	316645000.00	316645000.00
Sales Revenue	316645000.00	316645000.00	316645000.00	316645000.00	316645000.00	316645000.00
Interest on Securities	0.00	0.00	0.00	0.00	0.00	0.00
3. Other Income	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL CASH OUTFLOW	314468307.85	297074685.98	295697611.62	277926794.84	277926794.84	277926794.84
4. Increase In Fixed Assets	0.00	0.00	0.00	0.00	0.00	0.00
Fixed Investments	0.00	0.00	0.00	0.00	0.00	0.00
Pre-production Expenditures	0.00	0.00	0.00	0.00	0.00	0.00
5. Increase in Current Assets	16137561.50	0.00	0.00	0.00	0.00	0.00
6. Operating Costs	262406421.20	262406421.20	262406421.20	262406421.20	262406421.20	262406421.20
7. Corporate Tax Paid	13628835.46	14340024.19	14930198.91	15520373.64	15520373.64	15520373.64
8. Interest Paid	5901747.27	3934498.18	1967249.09	0.00	0.00	0.00
9. Loan Repayments	16393742.41	16393742.41	16393742.41	0.00	0.00	0.00
10.Dividends Paid	0.00	0.00	0.00	0.00	0.00	0.00
Surplus(Deficit)	5631001.25	19570314.02	20947388.38	38718205.16	38718205.16	38718205.16
Cumulative Cash Balance	58167033.06	77737347.08	98684735.46	137402940.62	176121145.78	214839350.94

Annex 3: DISCOUNTED CASH FLOW-TOTAL CAPITAL INVESTED

	CONSTRUCTION		PRODUCTION			
	Year 1	Year 2	1	2	3	4
TOTAL CASH INFLOW	0.00	0.00	189987000.00	221651500.00	253316000.00	284980500.00
1. Inflow Operation	0.00	0.00	189987000.00	221651500.00	253316000.00	284980500.00
Sales Revenue	0.00	0.00	189987000.00	221651500.00	253316000.00	284980500.00
Interest on Securities	0.00	0.00	0.00	0.00	0.00	0.00
2. Other Income	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL CASH OUTFLOW	18552450.00	18552450.00	233693839.20	196480601.25	231855225.85	260286867.46
3. Increase in Fixed Assets	18552450.00	18552450.00	0.00	0.00	0.00	0.00
Fixed Investments	17669000.00	17669000.00	0.00	0.00	0.00	0.00
Pre-production Expenditures	883450.00	883450.00	0.00	0.00	0.00	0.00
4. Increase in Net Working Capital	0.00	0.00	76099514.48	12683252.41	12683252.41	12683252.41
5. Operating Costs	0.00	0.00	157594324.72	183797348.84	210000372.96	236203397.08
6. Corporate Tax Paid	0.00	0.00	0.00	0.00	9171600.48	11400217.97
NET CASH FLOW	18552450.00	18552450.00	-43706839.20	25170898.75	21460774.15	24693632.54
CUMMULATIVE NET CASH FLOW	18552450.00	37104900.00	-80811739.20	-55640840.45	-34180066.30	-9486433.76
Net Present Value (at 18%)	18552450.00	15722415.25	-31389571.39	15319786.07	11069228.56	10793814.36
Cumulative Net present Value	18552450.00	34274865.25	-65664436.64	-50344650.57	-39275422.01	-28481607.65

Annex 3: DISCOUNTED CASH FLOW-TOTAL CAPITAL INVESTED (Continued)						
	PRODUCTION					
	5	6	7	8	9	10
TOTAL CASH INFLOW	316645000.00	316645000.00	316645000.00	316645000.00	316645000.00	316645000.00
1. Inflow Operation	316645000.00	316645000.00	316645000.00	316645000.00	316645000.00	316645000.00
Sales Revenue	316645000.00	316645000.00	316645000.00	316645000.00	316645000.00	316645000.00
Interest on Securities	0.00	0.00	0.00	0.00	0.00	0.00
2. Other Income	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL CASH OUTFLOW	288718509.07	276746445.39	277336620.11	277926794.84	277926794.84	277926794.84
3. Increase in Fixed Assets	0.00	0.00	0.00	0.00	0.00	0.00
Fixed Investments	0.00	0.00	0.00	0.00	0.00	0.00
Pre-production Expenditures	0.00	0.00	0.00	0.00	0.00	0.00
4. Increase in Net Working Capital	12683252.41	0.00	0.00	0.00	0.00	0.00
5. Operating Costs	262406421.20	262406421.20	262406421.20	262406421.20	262406421.20	262406421.20
6. Corporate Tax Paid	13628835.46	14340024.19	14930198.91	15520373.64	15520373.64	15520373.64
NET CASH FLOW	27926490.93	39898554.61	39308379.89	38718205.16	38718205.16	38718205.16
CUMMULATIVE NET CASH FLOW	18440057.16	58338611.78	97646991.66	136365196.82	175083401.98	213801607.14
Net Present Value (at 18%)	10344853.02	12525155.08	10457529.20	8729254.41	7397673.23	6269214.60
Cumulative Net present Value	-18136754.63	-5611599.55	4845929.66	13575184.07	20972857.30	27242071.90
Net Present Value (at 18%)	27,242,071.90					
Internal Rate of Return	26.4%					

Annex 4: NET INCOME STATEMENT (in Birr)					
	PRODUCTION				
	1	2	3	4	5
Capacity Utilization (%)	60%	70%	80%	90%	100%
1. Total Income	189987000.00	221651500.00	253316000.00	284980500.00	316645000.00
Sales Revenue	189987000.00	221651500.00	253316000.00	284980500.00	316645000.00
Other Income	0.00	0.00	0.00	0.00	0.00
2. Less Variable Cost	155683680.72	181630960.84	207578240.96	233525521.08	259472801.20
VARIABLE MARGIN	34303319.28	40020539.16	45737759.04	51454978.92	57172198.80
(In % of Total Income)	18.06	18.06	18.06	18.06	18.06
3. Less Fixed Costs	4818024.00	5073768.00	5329512.00	5585256.00	5841000.00
OPERATIONAL MARGIN	29485295.28	34946771.16	40408247.04	45869722.92	51331198.80
(In % of Total Income)	16	16	16	16	16
4. Less Cost of Finance	23224994.97	11803494.54	9836245.45	7868996.36	5901747.27
5. GROSS PROFIT	6260300.31	23143276.62	30572001.59	38000726.56	45429451.53
6. Income (Corporate) Tax	0.00	0.00	9171600.48	11400217.97	13628835.46
7. NET PROFIT	6260300.31	23143276.62	21400401.11	26600508.59	31800616.07
RATIOS (%)					
Gross Profit/Sales	3%	10%	12%	13%	14%
Net Profit After Tax/Sales	3%	10%	8%	9%	10%
Return on Investment	26%	28%	23%	23%	23%
Return on Equity	10%	35%	33%	41%	48%

Annex 4: NET INCOME STATEMENT (in Birr):Continued					
	PRODUCTION				
	6	7	8	9	10
Capacity Utilization (%)	100%	100%	100%	100%	100%
1. Total Income	316645000.00	316645000.00	316645000.00	316645000.00	316645000.00
Sales Revenue	316645000.00	316645000.00	316645000.00	316645000.00	316645000.00
Other Income	0.00	0.00	0.00	0.00	0.00
2. Less Variable Cost	259472801.20	259472801.20	259472801.20	259472801.20	259472801.20
VARIABLE MARGIN	57172198.80	57172198.80	57172198.80	57172198.80	57172198.80
(In % of Total Income)	18	18	18	18	18
3. Less Fixed Costs	5437620.00	5437620.00	5437620.00	5437620.00	5437620.00
OPERATIONAL MARGIN	51734578.80	51734578.80	51734578.80	51734578.80	51734578.80
(In % of Total Income)	16	16	16	16	16
4. Less Cost of Finance	3934498.18	1967249.09	0.00	0.00	0.00
5. GROSS PROFIT	47800080.62	49767329.71	51734578.80	51734578.80	51734578.80
6. Income (Corporate) Tax	14340024.19	14930198.91	15520373.64	15520373.64	15520373.64
7. NET PROFIT	33460056.43	34837130.80	36214205.16	36214205.16	36214205.16
RATIOS (%)					
Gross Profit/Sales	15%	16%	16%	16%	16%
Net Profit After Tax/Sales	11%	11%	11%	11%	11%
Return on Investment	23%	22%	22%	22%	22%
Return on Equity	51%	53%	55%	55%	55%

Annex 5: Projected Balance Sheet (in Birr)

	CONSTRUCTION		PRODUCTION			
	Year 1	Year 2	1	2	3	4
TOTAL ASSETS	18552450.00	163937424.13	190923578.98	201127422.28	209588390.07	223249465.35
1. Total Current Assets	0.00	126832524.13	156726058.98	169837282.28	181205630.07	197774085.35
Inventory on Materials and Supplies	0.00	0.00	62686785.68	73134583.29	83582380.90	94030178.52
Work in Progress	0.00	0.00	4309594.69	5027860.47	5746126.25	6464392.04
Finished Products in Stock	0.00	0.00	8619189.38	10055720.95	11492252.51	12928784.07
Accounts Receivable	0.00	0.00	20725854.55	24180163.64	27634472.73	31088781.82
Cash in Hand	0.00	0.00	483944.73	564602.18	645259.64	725917.09
Cash Surplus, Finance Available	0.00	126832524.13	59900689.96	56874351.75	52105138.04	52536031.81
Securities	0.00	0.00	0.00	0.00	0.00	0.00
2. Total Fixed Assets, Net of Depreciation	18552450.00	37104900.00	34197520.00	31290140.00	28382760.00	25475380.00
Fixed Investment	0.00	17669000.00	35338000.00	35338000.00	35338000.00	35338000.00
Construction in Progress	17669000.00	17669000.00	0.00	0.00	0.00	0.00
Pre-Production Expenditure	883450.00	1766900.00	1766900.00	1766900.00	1766900.00	1766900.00
Less Accumulated Depreciation	0.00	0.00	2907380.00	5814760.00	8722140.00	11629520.00
3. Accumulated Losses Brought Forward	0.00	0.00	0.00	0.00	0.00	0.00
4. Loss in Current Year	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL LIABILITIES	18552450.00	163937424.13	190923578.98	201127422.28	209588390.07	223249465.35
5. Total Current Liabilities	0.00	0.00	20725854.55	24180163.64	27634472.73	31088781.82
Accounts Payable	0.00	0.00	20725854.55	24180163.64	27634472.73	31088781.82
Bank Overdraft	0.00	0.00	0.00	0.00	0.00	0.00
6. Total Long-term Debt	11131470.00	98362454.48	98362454.48	81968712.07	65574969.65	49181227.24
Loan A	11131470.00	98362454.48	98362454.48	81968712.07	65574969.65	49181227.24
Loan B	0.00	0.00	0.00	0.00	0.00	0.00
7. Total Equity Capital	7420980.00	65574969.65	65574969.65	65574969.65	65574969.65	65574969.65
Ordinary Capital	7420980.00	65574969.65	65574969.65	65574969.65	65574969.65	65574969.65
Preference Capital	0.00	0.00	0.00	0.00	0.00	0.00
Subsidies	0.00	0.00	0.00	0.00	0.00	0.00
8. Reserves, Retained Profits Brought Forward	0.00	0.00	0.00	6260300.31	29403576.93	50803978.04
9. Net Profit After Tax	0.00	0.00	6260300.31	23143276.62	21400401.11	26600508.59
Dividends Payable	0.00	0.00	0.00	0.00	0.00	0.00
Retained Profits	0.00	0.00	6260300.31	23143276.62	21400401.11	26600508.59

Annex 5: Projected Balance Sheet (in Birr): Continued

	PRODUCTION					
	5	6	7	8	9	10
TOTAL ASSETS	242110648.10	259176962.12	277620350.50	313834555.66	350048760.82	386262965.98
1. Total Current Assets	219542648.10	239112962.12	260060350.50	298778555.66	337496760.82	376214965.98
Inventory on Materials and Supplies	104477976.13	104477976.13	104477976.13	104477976.13	104477976.13	104477976.13
Work in Progress	7182657.82	7182657.82	7182657.82	7182657.82	7182657.82	7182657.82
Finished Products in Stock	14365315.64	14365315.64	14365315.64	14365315.64	14365315.64	14365315.64
Accounts Receivable	34543090.91	34543090.91	34543090.91	34543090.91	34543090.91	34543090.91
Cash in Hand	806574.55	806574.55	806574.55	806574.55	806574.55	806574.55
Cash Surplus, Finance Available	58167033.06	77737347.08	98684735.46	137402940.62	176121145.78	214839350.94
Securities	0.00	0.00	0.00	0.00	0.00	0.00
2. Total Fixed Assets, Net of Depreciation	22568000.00	20064000.00	17560000.00	15056000.00	12552000.00	10048000.00
Fixed Investment	35338000.00	35338000.00	35338000.00	35338000.00	35338000.00	35338000.00
Construction in Progress	0.00	0.00	0.00	0.00	0.00	0.00
Pre-Production Expenditure	1766900.00	1766900.00	1766900.00	1766900.00	1766900.00	1766900.00
Less Accumulated Depreciation	14536900.00	17040900.00	19544900.00	22048900.00	24552900.00	27056900.00
3. Accumulated Losses Brought Forward	0.00	0.00	0.00	0.00	0.00	0.00
4. Loss in Current Year	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL LIABILITIES	242110648.10	259176962.12	277620350.50	313834555.66	350048760.82	386262965.98
5. Total Current Liabilities	34543090.91	34543090.91	34543090.91	34543090.91	34543090.91	34543090.91
Accounts Payable	34543090.91	34543090.91	34543090.91	34543090.91	34543090.91	34543090.91
Bank Overdraft	0.00	0.00	0.00	0.00	0.00	0.00
6. Total Long-term Debt	32787484.83	16393742.41	0.00	0.00	0.00	0.00
Loan A	32787484.83	16393742.41	0.00	0.00	0.00	0.00
Loan B	0.00	0.00	0.00	0.00	0.00	0.00
7. Total Equity Capital	65574969.65	65574969.65	65574969.65	65574969.65	65574969.65	65574969.65
Ordinary Capital	65574969.65	65574969.65	65574969.65	65574969.65	65574969.65	65574969.65
Preference Capital	0.00	0.00	0.00	0.00	0.00	0.00
Subsidies	0.00	0.00	0.00	0.00	0.00	0.00
8. Reserves, Retained Profits Brought Forward	77404486.64	109205102.71	142665159.14	177502289.94	213716495.10	249930700.26
9. Net Profit After Tax	31800616.07	33460056.43	34837130.80	36214205.16	36214205.16	36214205.16
Dividends Payable	0.00	0.00	0.00	0.00	0.00	0.00
Retained Profits	31800616.07	33460056.43	34837130.80	36214205.16	36214205.16	36214205.16