

**Investment Office ANRS**

**PROJECT PROFILE ON THE ESTABLISHMENT  
OF SUGAR CANE PLANTATION AND  
SUGAR MILL**

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## **1. Executive Summary**

This project profile deals with the establishment of sugar cane plantation and sugar mill in Amhara National Regional State. The following presents the main findings of the study.

Demand projection divulges that the domestic demand for sugar is substantial and is increasing with time. Accordingly, the planned plant is set to produce 16,000 tons annually. The total investment cost of the project including working capital is estimated at Birr 38.57 million and creates 177 jobs and Birr 1.275 million of income.

The financial result indicates that the project will generate profit beginning from the first year of operation. Moreover, the project will break even at 7.1% of capacity utilization and it will payback fully the initial investment less working capital in 1 year and 7 months. The result further shows that the calculated IRR of the project is 67.9% and the NPV discounted at 18% is Birr 112,742,716.34.

In addition to this, the proposed project possesses wide range of economic and social benefits such as increasing the level of investment, tax revenue and employment creation.

Generally, the project is technically feasible, financially and commercially viable as well as socially and economically acceptable. Hence the project is worth implementing.

## **2. Product Description and Application**

Sugar has become one of the essential food consumption items in the country especially in urban areas. Though per capita sugar consumption in Ethiopia is one of the lowest in the world, the volume of consumption has been growing steadily since the establishment of the first sugar cane plantations-cum-sugar mills in the Awash Valley in the early 1950's. As a sweetening food item, sugar is used in preparing all types of drinks (coffee, tea, soft drinks, juices, etc) and foods (pastries, bread of special types, etc).

## **3. Market Study, Plant Capacity and Production Program**

### **3.1 Market Study**

#### **3.1.1 Present Demand and Supply**

In Ethiopia, cane sugar production started in 1954/55. At present, there are three large-scale sugar establishments in the country. These establishments have a production capacity of 280,000 tons of sugar annually. White sugar is mainly exported to the neighboring countries such as Djibouti, Kenya and Yemen in quantities ranging between 30,000 to 50,000 tons per annum.

In addition to the existing cane sugar establishments, new sugar projects are under construction where one project has started production at the end of 2007 while the other is expected to be completed in the year 2008/09. The current domestic supply of sugar is estimated to reach about 300 thousand tons per annum.

Nonetheless, currently the demand for sugar is by far greater than the supply that pushed the market price to a very high level (birr 8/kilo). This gap between demand and supply required the importation of substantial amount of sugar from abroad. Accordingly, the government has imported 150 thousand tons of sugar in March 2008 in a bid to stabilize the sugar market. This quantity is half of what the three state-owned sugar factories produce annually. In view of the increasing demand, the country plans to increase its annual sugar production to 1.3 million tons by the year 2011. All this suggests the presence of substantial and growing demand for sugar.

#### **3.1.2 Projected Demand**

The future demand for sugar is expected to increase substantially given the present demand for domestic market. Accordingly, experts at the Ministry of Trade and Industry project an annual increase of 30 percent in demand due to population growth, per capita income increase as well as expansion of sugar based food production in the country. Therefore, the future demand for sugar is projected as shown in table 1 below.

**Table 1: Projected Demand for Sugar (in thousand ton)**

<b>Year</b>	<b>Projected Demand</b>
2007/08	419
2008/09	544
2009/10	707
2010/11	920
2011/12	1,196
2012/13	1,554
2013/14	2,021
2014/15	2,627
2015/16	3,415
2016/17	4,439

According to table 1 demand for sugar substantially increases in the coming years. In 2011/12 the level of demand is expected to reach about 1.2 million tons which is somewhat similar to the planned production of 1.3 million ton set by the government for that same year. Thus, it can be fairly assumed that the projected demand stated in the above table adequately reflects the future trend of demand for the product.

### **3.1.3 Pricing and Distribution**

Currently sugar is distributed to the wholesalers by the Ethiopian Sugar Development Agency (ESDA). That is, every month the Agency injects sugar into the market floating a tender for bidders interested in distributing the commodity. The threshold amount for bidders is Birr 500 per quintal. Therefore, based on the market research result and the capacity of the envisaged plant, the selling price of a quintal of sugar is set to be Birr 400 per quintal. In distributing the product, the envisaged plant shall make use of the available wholesale network.

### **3.2 Plant Capacity**

Thus, given the expected demand for sugar as presented earlier, and the planned technology and investment, the envisaged plant is set to produce 16,000 tons annually. Assuming that the envisaged plant starts operation by 2010/11, the above capacity is only 1.75% of the projected demand.

### **3.3 Production Program**

The program is scheduled based on the consideration that the envisaged plant will work 250 days in a year in 1 shift, where the remaining days will be holidays and for maintenance. During the first year of operation the plant will operate at 40 percent capacity and then at 60 percent in the 2<sup>nd</sup> year and 80 percent in the 3<sup>rd</sup> year. The capacity will grow to 100 percent starting from the 4<sup>th</sup> year. This consideration is developed based on the assumption that logistics barriers would be eliminated gradually within the first three years of operation.

## **4. Raw Materials and Utilities**

### **4.1 Availability and Source of Raw Materials**

The main raw materials required in production of sugar are sugar cane, sulphur, lime and polyethylene bags. Sugar cane will be available from the sugar cane plantation of the envisaged plant. Accordingly, the annual demand of the mill is estimated to be 160,000 tons of sugar cane. On the other hand sulphur and lime will be imported from abroad while polyethylene bag will be purchased from domestic firms.

### **4.2 Annual Requirement and Cost of Raw Materials and Utilities**

The annual raw material and utility requirement and the associated cost for the envisaged plant is presented in table 2 here under.

**Table 2 Material and Utility Requirement**

Material and Input	Quantity	Total Cost	
		L.C.	F.C.
Sulphur	80 ton		800,000
Lime	200 ton		600,000
Polyethylene Bag (100kg cap)	165,000 pcs	412,500	
<b>Total Material Cost</b>		412,500	1,400,000
Utility			
Electricity	240,000 kwh	132,000	
Process Water	160,000 m <sup>3</sup>	640,000	
<b>Total Utility Cost</b>		772,000	

According to table 2, the annual cost of material and utility at full capacity of operation is estimated to be Birr 2,584,500.

## 5 Location and Site

The appropriate locations for the envisaged project, in view of the availability of input and infrastructure, is Bure.

## 6 Technology and Engineering

### 6.1 Production Process

The process of producing sugar is stated as below.

**Step I-** Production of Sugar Cane: The first step in the process is the cultivation of the sugar cane. This requires the development of 600 ha of seed bed of sugar cane that will allow to cultivate 3 modules of 2000 ha each. This plantation will provide the raw material to an industrial plant that sues 80 tons of sugar cane per hour.

**Step I-** Harvesting: The second step is harvesting of sugar cane where it is weighed and fed manually to the cane carrier and transporting it into the mill plant. Each ton of sugar-cane produces about 100 kg of sugar, meaning that 10% of the total weight of the sugar-cane can be transformed into crystal sugar. An average yield per hectare is 80 tons of sugar-cane.

**Step II- Crushing:** As soon as the cane reaches the mill, it is sliced and shredded in order to facilitate juice extraction in the crushing process that follows. Generally three or more sets of three-roller mills are used to press juice out of the cane. The woody fiber left as residue is called bagasse and is used as fuel in the boilers, producing steam and electricity.

**Step III- Purification of the juice:** The purpose of this step is to remove the largest possible number of impurities at the beginning. Purification is done by adding sulphur dioxide and lime and heating them. At the first stage, sulphur dioxide is added to the juice and then lime, and heat applied. The final pH is adjusted to 8-8.5. The chemically treated juice is left to precipitate in a continuous decanter and the precipitate (sludge) is filtered through a vacuum filter. Purified juice from the decanter and clear juice from the vacuum filter are mixed together.

**Step IV- Evaporation:** Clear juice is concentrated in multiple-effect vacuum evaporators to a concentration of 55-65% sucrose. Steam is generated by the boilers, which use bagasse as fuel.

**Step V- Crystallization:** The concentrated juice or syrup is further evaporated until it is saturated with sugar. This process is also carried out in vacuum pans. As the syrup becomes saturated, sugar crystals are formed. As water evaporates, more syrup is added to the pan and sugar is deposited on the crystals that have already formed. The final mass of syrup and sugar crystals is known as massecuite.

**Step VI: Centrifuging:** The massecuite is centrifuged in a basket-type centrifuge. Crystals of sugar remain in the basket, while the liquid (molasses) is thrown out through the perforations in the sides of the basket by centrifugal force. The sugar crystals are brown and still contain some syrup. This sugar, known as raw sugar, can be prepared further for consumption by refining. The molasses still contain crystallizable sucrose, which is again mixed with syrup and returned to the vacuum pans. The new massecuite is centrifuged and the molasses returned to the vacuum pan once more to be treated as before. After the centrifugal treatment has been repeated three times, higher quality “A” and “\*B\*” sugars are ready to be bagged, after drying, and the “C” (lower grade) sugar is returned to the vacuum pans as a base for more “A” and “B” sugars. Molasses



with such a low sucrose concentration that the removal of sucrose is uneconomical are used as a raw material for alcoholic fermentation for the production of alcohol.

**Step VII- Distillation:** Alcohol produced by yeast fermentation is distilled from wine in column stills with a production of 95-96% alcohol and 12-13 litres of vinasse per liter of alcohol produced. Vinasse is very rich in organic matter and, because of its high biochemical oxygen demand; it cannot be emptied into rivers. It can be used as fertilizer, however, as it adds nitrogen, potassium and phosphorus to the soil.

It is important to note that a cane-sugar processing facility is self-sufficient in its energy requirements. After the cane juice has been extracted from the sugar-cane plant by crushing and washing, the plant becomes bagasse, a cellulosic material that produces heat through combustion. This heat is used to produce steam at high pressure in special boilers. The steam generated is used for special crushing boilers and for crushing, heating, evaporation, drying and also for producing electricity.

The alternative technologies are related to the production of white sugar or cube sugar. In Ethiopia white sugar is produced mainly for export while cube sugar is consumed by luxurious hotels as well as by few affluent homes. As the product of the envisaged plant will be sold to domestic consumers, the alternative technologies will not be required by the envisaged plant.

## **6.2 Machinery and Equipment**

The machineries and equipment required for producing sugar is detailed in table 3 below.

**Table 3: Machinery and Equipment**

<b>Machinery and Equipment</b>	<b>Quantity</b>
Boilers	1
Washers	1
Knives	1
Shredders	1
Mills tandem	1
Tanks	5
Decanters	1
Vacuum filters	1
Heat exchangers	4
Vacuum evaporators	1
Vacuum pans	1
Crystallizers	1
Centrifuges	1
Fermentation tanks	4
Pumps	6
Column still	1
Driers	1
Electricity generators	1
Fork lifters	2
Alcohol tanks	3
Molasses tank	1

The total cost of machinery and equipment including freight insurance and bank cost is estimated to be about Birr 22,500,000.

The following are some of the machineries suppliers' address for the envisaged project

**Kay Iron Works (Jorian) Private Limited**

Radaur Road, Opposite Power House,

Jorian, Yamunanagar, Haryana - 135 001, India

Phone: +(91)-(1732)-297163

Fax: +(91)-(1732)-297169

Website: <http://www.indiamart.com/kayironjorian>

**Techfa Industrial Services Iran**

No.88 Mashahir St.. Ghaem Magham Ave. Tehran Iran

Tel: 98-21-88836840

### 6.3 Civil Engineering Cost

Assuming an average yield of 80 tons of sugar cane per hectare and a 3-year cropping cycle, the land requirement for the plantation is given below.

- 2,000 hectares for one year operation
- 6,000 hectares of total agricultural land

The total site area for the envisaged sugar mill is estimated to be 15,000m<sup>2</sup> with a built up area of 10,000m<sup>2</sup> for the various facilities-production, storage and office facilities.

## 7 Human Resource and Training Requirement

### 7.1 Human Resource

The required manpower for the envisaged plant is stated in table 4 below.

**Table 4: Human Resource Requirement**

Position	No. Required	Monthly Salary	Total Annual Salary
Manager	1	5000	60000
Administrator	1	3500	42000
Finance Head	1	3000	36000
Accountant	2	1500	36000
Secretary	2	1100	26400
Sales Clerk	4	600	28800
Production Manager	1	4000	48000
Chemical Engineer	1	3000	36000
Chemist	2	1200	28800
Store Keeper	4	600	28800
Technician	4	1200	57600
Operators	20	600	144000
Daily Laborers	120	300	432000
Cleaners	4	300	14400
Messengers	2	300	7200
Driver	3	600	21600
Guards	5	300	18000
Benefit (20%)			209520
<b>Total</b>	<b>177</b>		<b>1275120</b>

The envisaged plant creates 177 jobs and about Birr 1.275 million of income. The professionals and support staff for the envisaged plant shall be recruited from Amhara region.

## **7.2 Training Requirement**

Training of key personnel shall be conducted in collaboration with the suppliers of the plant machineries. The training should primarily focus on the production technology and machinery maintenance and trouble shooting. Birr 250,000 will be allocated as training expense.

# **8 Financial Analysis**

## **8.1 Underlying Assumption**

The financial analysis of sugar cane plantation and sugar mill plant is based on the data provided in the preceding sections and the following assumptions.

### **A. Construction and Finance**

Construction/Pre-Production period	2 years
Source of finance	40% equity and 60% loan
Tax holidays	2 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
Raw Material-Foreign	120
Factory Supplies in Stock	30
Spare Parts in Stock and Maintenance	30
Work in Progress	10
Finished Products	15
Accounts Receivable	30
Cash in Hand	30
Accounts Payable	30

### 8.2 Investment

The total investment cost of the project including working capital is estimated at Birr 38.576 million as shown in table 5 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 5: Total initial investment**

Items	L.C	F.C	Total
Land	480,120		480,120
Building and civil works	10,000,000		10,000,000
Office equipment	250,000		250,000
Vehicles	1,800,000		1,800,000
Plant machinery & equipment	7,500,000	15,000,000	22,500,000
<i>Total fixed investment cost</i>	<i>20,030,120</i>	<i>15,000,000</i>	<i>35,030,120</i>
Pre production capital expenditure*	1,751,506		1,751,506
<i>Total initial investment</i>	<i>21,781,626</i>	<i>15,000,000</i>	<i>36,781,626</i>
Working capital at full capacity	1,123,067	672,000	1,795,067
<b>Total</b>	<b>22,904,693</b>	<b>15,672,000</b>	<b>38,576,693</b>

*\*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 40.6% of the total investment cost.

### 8.3 Production Costs

The total production cost at full capacity operation is estimated at Birr 10.47 million as detailed in table 6 below.

**Table 6: Production Cost**

<b>Items</b>	<b>Cost</b>
1. Raw materials	1,812,500
2. Utilities	772,000
3. Wages and Salaries	1,275,120
4. Spares and Maintenance	350,301
<b><i>Factory costs</i></b>	<b><i>4,209,921</i></b>
5. Depreciation	3,485,301
6. Financial costs	2,777,522
<b><i>Total Production Cost</i></b>	<b><i>10,472,744</i></b>

### 8.4 Financial Evaluation

#### *I. Profitability*

According to the projected income statement attached in the annex part (see annex 4) the project will generate profit beginning from the first year of operation. Ratios such as the percentage of net profit to total sales, return on equity and return on total investment are 54%, 90% and 54% respectively in the first year and will further rise in the subsequent periods. Furthermore, 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 break even at 7.2 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 1 year and 7 months.

#### *IV. Simple Rate of Return*

For the envisaged plant the simple rate of return equals to 103.1%.

#### *V. Internal Rate of Return and Net Present Value*

Based on cash flow statement described in the annex part, the calculated IRR of the project is 67.9% and the net present value at 18 % discount is Birr 112,742,716.34.

#### *VI. Sensitivity Analysis*

The envisaged plant is modestly profitable even with considerable cost increment. That is the plant maintains to be profitable starting from the first year when 10 % cost increment takes place in the sector.

## **9 Economic and Social Benefits and Justification**

The envisaged project possesses wide range of benefits that promote the socio-economic goals and objectives stated in the strategic plan of the Amhara National Regional State. It also boosts the inter sectorial linkage between the agricultural and industrial sector. At the same time, therefore, it helps diversify the economic activity of the region. The other major benefits are listed as follows:

### ***A. Profit Generation***

The project is found to be financially viable and earns on average a profit of Birr 34.7 million per year and Birr 347.3 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 130.3 million from corporate tax payment alone (i.e. excluding income tax, sales tax and VAT). Such result creates additional fund for the regional government that will be used in expanding social and other basic services in the region.

### ***C. Employment and Income Generation***

The proposed project is expected to create employment opportunity for several citizens of the region. That is, it will provide permanent employment to 177 professionals as well as support staff. Consequently the project creates income of Birr 1.275 million per year. This would be one of the commendable accomplishments of the project.



# **ANNEXES**

<b>Annex 1: Total Net Working Capital Requirements (in Birr)</b>						
	<b>CONSTRUCTION</b>		<b>PRODUCTION</b>			
	<b>Year 1</b>	<b>Year 2</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>Capacity Utilization (%)</b>	0.00	0.00	40%	60%	80%	100%
<b>1. Total Inventory</b>	0.00	0.00	908365.09	1362547.63	1816730.17	2270912.71
<b>Raw Materials in Stock- Total</b>	0.00	0.00	288600.00	432900.00	577200.00	721500.00
<b>Raw Material-Local</b>	0.00	0.00	19800.00	29700.00	39600.00	49500.00
<b>Raw Material-Foreign</b>	0.00	0.00	268800.00	403200.00	537600.00	672000.00
<b>Factory Supplies in Stock</b>	0.00	0.00	3693.71	5540.56	7387.41	9234.27
<b>Spare Parts in Stock and Maintenance</b>	0.00	0.00	50443.37	75665.06	100886.75	126108.43
<b>Work in Progress</b>	0.00	0.00	92342.67	138514.00	184685.34	230856.67
<b>Finished Products</b>	0.00	0.00	184685.34	277028.01	369370.68	461713.34
<b>2. Accounts Receivable</b>	0.00	0.00	3072000.00	4608000.00	6144000.00	7680000.00
<b>3. Cash in Hand</b>	0.00	0.00	98261.76	147392.64	196523.52	245654.40
<b>CURRENT ASSETS</b>	0.00	0.00	3790026.85	5685040.27	7580053.69	9475067.11
<b>4. Current Liabilities</b>	0.00	0.00	3072000.00	4608000.00	6144000.00	7680000.00
<b>Accounts Payable</b>	0.00	0.00	3072000.00	4608000.00	6144000.00	7680000.00
<b>TOTAL NET WORKING CAPITAL REQUIRMENTS</b>	0.00	0.00	718026.85	1077040.27	1436053.69	1795067.11
<b>INCREASE IN NET WORKING CAPITAL</b>	0.00	0.00	718026.85	359013.42	359013.42	359013.42

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

	PRODUCTION					
	5	6	7	8	9	10
<b>Capacity Utilization (%)</b>	100%	100%	100%	100%	100%	100%
<b>1. Total Inventory</b>	2270912.71	2270912.71	2270912.71	2270912.71	2270912.71	2270912.71
<b>Raw Materials in Stock-Total</b>	721500.00	721500.00	721500.00	721500.00	721500.00	721500.00
<b>Raw Material-Local</b>	49500.00	49500.00	49500.00	49500.00	49500.00	49500.00
<b>Raw Material-Foreign</b>	672000.00	672000.00	672000.00	672000.00	672000.00	672000.00
<b>Factory Supplies in Stock</b>	9234.27	9234.27	9234.27	9234.27	9234.27	9234.27
<b>Spare Parts in Stock and Maintenance</b>	126108.43	126108.43	126108.43	126108.43	126108.43	126108.43
<b>Work in Progress</b>	230856.67	230856.67	230856.67	230856.67	230856.67	230856.67
<b>Finished Products</b>	461713.34	461713.34	461713.34	461713.34	461713.34	461713.34
<b>2. Accounts Receivable</b>	7680000.00	7680000.00	7680000.00	7680000.00	7680000.00	7680000.00
<b>3. Cash in Hand</b>	245654.40	245654.40	245654.40	245654.40	245654.40	245654.40
<b>CURRENT ASSETS</b>	9475067.11	9475067.11	9475067.11	9475067.11	9475067.11	9475067.11
<b>4. Current Liabilities</b>	7680000.00	7680000.00	7680000.00	7680000.00	7680000.00	7680000.00
<b>Accounts Payable</b>	7680000.00	7680000.00	7680000.00	7680000.00	7680000.00	7680000.00
<b>TOTAL NET WORKING CAPITAL REQUIRMENTS</b>	1795067.11	1795067.11	1795067.11	1795067.11	1795067.11	1795067.11
<b>INCREASE IN NET WORKING CAPITAL</b>	0.00	0.00	0.00	0.00	0.00	0.00

<b>Annex 2: Cash Flow Statement (in Birr)</b>						
	<b>CONSTRUCTION</b>		<b>PRODUCTION</b>			
	<b>Year 1</b>	<b>Year 2</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>TOTAL CASH INFLOW</b>	18390813.00	20185880.11	28672000.00	39936000.00	52736000.00	65536000.00
<b>1. Inflow Funds</b>	18390813.00	20185880.11	3072000.00	1536000.00	1536000.00	1536000.00
<b>Total Equity</b>	7356325.20	8074352.05	0.00	0.00	0.00	0.00
<b>Total Long Term Loan</b>	11034487.80	12111528.07	0.00	0.00	0.00	0.00
<b>Total Short Term Finances</b>	0.00	0.00	3072000.00	1536000.00	1536000.00	1536000.00
<b>2. Inflow Operation</b>	0.00	0.00	25600000.00	38400000.00	51200000.00	64000000.00
<b>Sales Revenue</b>	0.00	0.00	25600000.00	38400000.00	51200000.00	64000000.00
<b>Interest on Securities</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>3. Other Income</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>TOTAL CASH OUTFLOW</b>	18390813.00	18390813.00	11973513.85	11253852.02	24144986.77	28212062.65
<b>4. Increase In Fixed Assets</b>	18390813.00	18390813.00	0.00	0.00	0.00	0.00
<b>Fixed Investments</b>	17515060.00	17515060.00	0.00	0.00	0.00	0.00
<b>Pre-production Expenditures</b>	875753.00	875753.00	0.00	0.00	0.00	0.00
<b>5. Increase in Current Assets</b>	0.00	0.00	3790026.85	1895013.42	1895013.42	1895013.42
<b>6. Operating Costs</b>	0.00	0.00	1936332.94	2723647.38	3510961.83	4298276.27
<b>7. Corporate Tax Paid</b>	0.00	0.00	0.00	0.00	12566740.62	16309422.38
<b>8. Interest Paid</b>	0.00	0.00	6247154.06	2777521.90	2314601.59	1851681.27
<b>9. Loan Repayments</b>	0.00	0.00	0.00	3857669.31	3857669.31	3857669.31
<b>10. Dividends Paid</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>Surplus(Deficit)</b>	0.00	1795067.11	16698486.15	28682147.98	28591013.23	37323937.35
<b>Cumulative Cash Balance</b>	0.00	1795067.11	18493553.27	47175701.24	75766714.48	113090651.82

<b>Annex 2: Cash Flow Statement (in Birr): Continued</b>						
	<b>PRODUCTION</b>					
	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<b>TOTAL CASH INFLOW</b>	64000000.00	64000000.00	64000000.00	64000000.00	64000000.00	64000000.00
<b>1. Inflow Funds</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total Equity</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total Long Term Loan</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total Short Term Finances</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>2. Inflow Operation</b>	64000000.00	64000000.00	64000000.00	64000000.00	64000000.00	64000000.00
<b>Sales Revenue</b>	64000000.00	64000000.00	64000000.00	64000000.00	64000000.00	64000000.00
<b>Interest on Securities</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>3. Other Income</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>TOTAL CASH OUTFLOW</b>	25993005.01	25882051.15	25558006.93	21376293.39	21376293.39	21376293.39
<b>4. Increase In Fixed Assets</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fixed Investments</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>Pre-production Expenditures</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>5. Increase in Current Assets</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>6. Operating Costs</b>	4298276.27	4298276.27	4298276.27	4298276.27	4298276.27	4298276.27
<b>7. Corporate Tax Paid</b>	16448298.47	16800264.93	16939141.02	17078017.12	17078017.12	17078017.12
<b>8. Interest Paid</b>	1388760.95	925840.63	462920.32	0.00	0.00	0.00
<b>9. Loan Repayments</b>	3857669.31	3857669.31	3857669.31	0.00	0.00	0.00
<b>10.Dividends Paid</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>Surplus(Deficit)</b>	38006994.99	38117948.85	38441993.07	42623706.61	42623706.61	42623706.61
<b>Cumulative Cash Balance</b>	151097646.81	189215595.67	227657588.74	270281295.35	312905001.96	355528708.56

<b>Annex 3: DISCOUNTED CASH FLOW-TOTAL CAPITAL INVESTED</b>						
	<b>CONSTRUCTION</b>		<b>PRODUCTION</b>			
	<b>Year 1</b>	<b>Year 2</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>TOTAL CASH INFLOW</b>	0.00	0.00	25600000.00	38400000.00	51200000.00	64000000.00
<b>1. Inflow Operation</b>	0.00	0.00	25600000.00	38400000.00	51200000.00	64000000.00
<b>Sales Revenue</b>	0.00	0.00	25600000.00	38400000.00	51200000.00	64000000.00
<b>Interest on Securities</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>2. Other Income</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>TOTAL CASH OUTFLOW</b>	18390813.00	18390813.00	2654359.79	3082660.81	3869975.25	20966712.07
<b>3. Increase in Fixed Assets</b>	18390813.00	18390813.00	0.00	0.00	0.00	0.00
<b>Fixed Investments</b>	17515060.00	17515060.00	0.00	0.00	0.00	0.00
<b>Pre-production Expenditures</b>	875753.00	875753.00	0.00	0.00	0.00	0.00
<b>4. Increase in Net Working Capital</b>	0.00	0.00	718026.85	359013.42	359013.42	359013.42
<b>5. Operating Costs</b>	0.00	0.00	1936332.94	2723647.38	3510961.83	4298276.27
<b>6. Corporate Tax Paid</b>	0.00	0.00	0.00	0.00	12566740.62	16309422.38
<b>NET CASH FLOW</b>	-18390813.00	-18390813.00	22945640.21	35317339.19	47330024.75	43033287.93
<b>CUMMULATIVE NET CASH FLOW</b>	-18390813.00	-36781626.00	-13835985.79	21481353.41	68811378.15	111844666.08
<b>Net Present Value (at 18%)</b>	-18390813.00	-15585434.75	16479201.53	21495222.97	24412300.23	18810246.76
<b>Cumulative Net present Value</b>	-18390813.00	-33976247.75	-17497046.21	3998176.76	28410476.99	47220723.74

<b>Annex 3: DISCOUNTED CASH FLOW-TOTAL CAPITAL INVESTED (Continued)</b>						
	<b>PRODUCTION</b>					
	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<b>TOTAL CASH INFLOW</b>	64000000.00	64000000.00	64000000.00	64000000.00	64000000.00	64000000.00
<b>1. Inflow Operation</b>	64000000.00	64000000.00	64000000.00	64000000.00	64000000.00	64000000.00
<b>Sales Revenue</b>	64000000.00	64000000.00	64000000.00	64000000.00	64000000.00	64000000.00
<b>Interest on Securities</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>2. Other Income</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>TOTAL CASH OUTFLOW</b>	20746574.75	21098541.20	21237417.30	21376293.39	21376293.39	21376293.39
<b>3. Increase in Fixed Assets</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fixed Investments</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>Pre-production Expenditures</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>4. Increase in Net Working Capital</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>5. Operating Costs</b>	4298276.27	4298276.27	4298276.27	4298276.27	4298276.27	4298276.27
<b>6. Corporate Tax Paid</b>	16448298.47	16800264.93	16939141.02	17078017.12	17078017.12	17078017.12
<b>NET CASH FLOW</b>	43253425.25	42901458.80	42762582.70	42623706.61	42623706.61	42623706.61
<b>CUMMULATIVE NET CASH FLOW</b>	155098091.33	197999550.13	240762132.84	283385839.45	326009546.05	368633252.66
<b>Net Present Value (at 18%)</b>	16022432.89	13467841.88	11376478.98	9609773.42	8143875.78	6901589.64
<b>Cumulative Net present Value</b>	63243156.63	76710998.51	88087477.49	97697250.91	105841126.69	112742716.34
<b>Net Present Value (at 18%)</b>	<b>112,742,716.34</b>					
<b>Internal Rate of Return</b>	<b>67.9%</b>					

<b>Annex 4: NET INCOME STATEMENT ( in Birr)</b>					
	<b>PRODUCTION</b>				
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Capacity Utilization (%)</b>	40%	60%	80%	100%	100%
<b>1. Total Income</b>	25600000.00	38400000.00	51200000.00	64000000.00	64000000.00
<b>Sales Revenue</b>	25600000.00	38400000.00	51200000.00	64000000.00	64000000.00
<b>Other Income</b>	0.00	0.00	0.00	0.00	0.00
<b>2. Less Variable Cost</b>	1370609.69	2055914.53	2741219.38	3426524.22	3426524.22
<b>VARIABLE MARGIN</b>	24229390.31	36344085.47	48458780.62	60573475.78	60573475.78
<b>(In % of Total Income)</b>	94.65	94.65	94.65	94.65	94.65
<b>3. Less Fixed Costs</b>	4051024.45	4153034.05	4255043.65	4357053.25	4357053.25
<b>OPERATIONAL MARGIN</b>	20178365.86	32191051.42	44203736.97	56216422.53	56216422.53
<b>(In % of Total Income)</b>	78.82	83.83	86.34	87.84	87.84
<b>4. Less Cost of Finance</b>	6247154.06	2777521.90	2314601.59	1851681.27	1388760.95
<b>5. GROSS PROFIT</b>	13931211.80	29413529.51	41889135.38	54364741.26	54827661.57
<b>6. Income (Corporate) Tax</b>	0.00	0.00	12566740.62	16309422.38	16448298.47
<b>7. NET PROFIT</b>	13931211.80	29413529.51	29322394.77	38055318.88	38379363.10
<b>RATIOS (%)</b>					
<b>Gross Profit/Sales</b>	54%	77%	82%	85%	86%
<b>Net Profit After Tax/Sales</b>	54%	77%	57%	59%	60%
<b>Return on Investment</b>	54%	85%	83%	103%	103%
<b>Return on Equity</b>	90%	191%	190%	247%	249%



<b>Annex 4: NET INCOME STATEMENT (in Birr):Continued</b>					
	<b>PRODUCTION</b>				
	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<b>Capacity Utilization (%)</b>	100%	100%	100%	100%	100%
<b>1. Total Income</b>	64000000.00	64000000.00	64000000.00	64000000.00	64000000.00
<b>Sales Revenue</b>	64000000.00	64000000.00	64000000.00	64000000.00	64000000.00
<b>Other Income</b>	0.00	0.00	0.00	0.00	0.00
<b>2. Less Variable Cost</b>	3426524.22	3426524.22	3426524.22	3426524.22	3426524.22
<b>VARIABLE MARGIN</b>	60573475.78	60573475.78	60573475.78	60573475.78	60573475.78
<b>(In % of Total Income)</b>	94.65	94.65	94.65	94.65	94.65
<b>3. Less Fixed Costs</b>	3646752.05	3646752.05	3646752.05	3646752.05	3646752.05
<b>OPERATIONAL MARGIN</b>	56926723.73	56926723.73	56926723.73	56926723.73	56926723.73
<b>(In % of Total Income)</b>	88.95	88.95	88.95	88.95	88.95
<b>4. Less Cost of Finance</b>	925840.63	462920.32	0.00	0.00	0.00
<b>5. GROSS PROFIT</b>	56000883.09	56463803.41	56926723.73	56926723.73	56926723.73
<b>6. Income (Corporate) Tax</b>	16800264.93	16939141.02	17078017.12	17078017.12	17078017.12
<b>7. NET PROFIT</b>	39200618.16	39524662.39	39848706.61	39848706.61	39848706.61
<b>RATIOS (%)</b>					
<b>Gross Profit/Sales</b>	88%	88%	89%	89%	89%
<b>Net Profit After Tax/Sales</b>	61%	62%	62%	62%	62%
<b>Return on Investment</b>	104%	104%	103%	103%	103%
<b>Return on Equity</b>	254%	256%	258%	258%	258%

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

	CONSTRUCTION		PRODUCTION			
	Year 1	Year 2	1	2	3	4
<b>TOTAL ASSETS</b>	18390813.00	38576693.11	55579904.91	82671765.11	109672490.57	145406140.14
<b>1. Total Current Assets</b>	0.00	1795067.11	22283580.11	52860741.51	83346768.17	122565718.94
Inventory on Materials and Supplies	0.00	0.00	342737.08	514105.62	685474.16	856842.70
Work in Progress	0.00	0.00	92342.67	138514.00	184685.34	230856.67
Finished Products in Stock	0.00	0.00	184685.34	277028.01	369370.68	461713.34
Accounts Receivable	0.00	0.00	3072000.00	4608000.00	6144000.00	7680000.00
Cash in Hand	0.00	0.00	98261.76	147392.64	196523.52	245654.40
Cash Surplus, Finance Available	0.00	1795067.11	18493553.27	47175701.24	75766714.48	113090651.82
Securities	0.00	0.00	0.00	0.00	0.00	0.00
<b>2. Total Fixed Assets, Net of Depreciation</b>	18390813.00	36781626.00	33296324.80	29811023.60	26325722.40	22840421.20
Fixed Investment	0.00	17515060.00	35030120.00	35030120.00	35030120.00	35030120.00
Construction in Progress	17515060.00	17515060.00	0.00	0.00	0.00	0.00
Pre-Production Expenditure	875753.00	1751506.00	1751506.00	1751506.00	1751506.00	1751506.00
Less Accumulated Depreciation	0.00	0.00	3485301.20	6970602.40	10455903.60	13941204.80
<b>3. Accumulated Losses Brought Forward</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>4. Loss in Current Year</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>TOTAL LIABILITIES</b>	18390813.00	38576693.11	55579904.91	82671765.11	109672490.57	145406140.14
<b>5. Total Current Liabilities</b>	0.00	0.00	3072000.00	4608000.00	6144000.00	7680000.00
Accounts Payable	0.00	0.00	3072000.00	4608000.00	6144000.00	7680000.00
Bank Overdraft	0.00	0.00	0.00	0.00	0.00	0.00
<b>6. Total Long-term Debt</b>	11034487.80	23146015.87	23146015.87	19288346.56	15430677.25	11573007.93
Loan A	11034487.80	23146015.87	23146015.87	19288346.56	15430677.25	11573007.93
Loan B	0.00	0.00	0.00	0.00	0.00	0.00
<b>7. Total Equity Capital</b>	7356325.20	15430677.25	15430677.25	15430677.25	15430677.25	15430677.25
Ordinary Capital	7356325.20	15430677.25	15430677.25	15430677.25	15430677.25	15430677.25
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
<b>8. Reserves, Retained Profits Brought Forward</b>	0.00	0.00	0.00	13931211.80	43344741.31	72667136.08
<b>9. Net Profit After Tax</b>	0.00	0.00	13931211.80	29413529.51	29322394.77	38055318.88
Dividends Payable	0.00	0.00	0.00	0.00	0.00	0.00
Retained Profits	0.00	0.00	13931211.80	29413529.51	29322394.77	38055318.88

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

	PRODUCTION					
	5	6	7	8	9	10
<b>TOTAL ASSETS</b>	179927833.93	215270782.78	250937775.86	290786482.46	330635189.07	370483895.68
<b>1. Total Current Assets</b>	160572713.93	198690662.78	237132655.86	279756362.46	322380069.07	365003775.68
Inventory on Materials and Supplies	856842.70	856842.70	856842.70	856842.70	856842.70	856842.70
Work in Progress	230856.67	230856.67	230856.67	230856.67	230856.67	230856.67
Finished Products in Stock	461713.34	461713.34	461713.34	461713.34	461713.34	461713.34
Accounts Receivable	7680000.00	7680000.00	7680000.00	7680000.00	7680000.00	7680000.00
Cash in Hand	245654.40	245654.40	245654.40	245654.40	245654.40	245654.40
Cash Surplus, Finance Available	151097646.81	189215595.67	227657588.74	270281295.35	312905001.96	355528708.56
Securities	0.00	0.00	0.00	0.00	0.00	0.00
<b>2. Total Fixed Assets, Net of Depreciation</b>	19355120.00	16580120.00	13805120.00	11030120.00	8255120.00	5480120.00
Fixed Investment	35030120.00	35030120.00	35030120.00	35030120.00	35030120.00	35030120.00
Construction in Progress	0.00	0.00	0.00	0.00	0.00	0.00
Pre-Production Expenditure	1751506.00	1751506.00	1751506.00	1751506.00	1751506.00	1751506.00
Less Accumulated Depreciation	17426506.00	20201506.00	22976506.00	25751506.00	28526506.00	31301506.00
<b>3. Accumulated Losses Brought Forward</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>4. Loss in Current Year</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>TOTAL LIABILITIES</b>	179927833.93	215270782.78	250937775.86	290786482.46	330635189.07	370483895.68
<b>5. Total Current Liabilities</b>	7680000.00	7680000.00	7680000.00	7680000.00	7680000.00	7680000.00
Accounts Payable	7680000.00	7680000.00	7680000.00	7680000.00	7680000.00	7680000.00
Bank Overdraft	0.00	0.00	0.00	0.00	0.00	0.00
<b>6. Total Long-term Debt</b>	7715338.62	3857669.31	0.00	0.00	0.00	0.00
Loan A	7715338.62	3857669.31	0.00	0.00	0.00	0.00
Loan B	0.00	0.00	0.00	0.00	0.00	0.00
<b>7. Total Equity Capital</b>	15430677.25	15430677.25	15430677.25	15430677.25	15430677.25	15430677.25
Ordinary Capital	15430677.25	15430677.25	15430677.25	15430677.25	15430677.25	15430677.25
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
<b>8. Reserves, Retained Profits Brought Forward</b>	110722454.96	149101818.06	188302436.22	227827098.61	267675805.22	307524511.83
<b>9. Net Profit After Tax</b>	38379363.10	39200618.16	39524662.39	39848706.61	39848706.61	39848706.61
Dividends Payable	0.00	0.00	0.00	0.00	0.00	0.00
Retained Profits	38379363.10	39200618.16	39524662.39	39848706.61	39848706.61	39848706.61