

**Investment Office ANRS**

**PROJECT PROFILE ON THE ESTABLISHMENT  
OF GEMSTONE PRODUCTION PLANT**

*Development Studies Associates (DSA)*

**October 2008  
Addis Ababa**

# Table of Contents

<b>1. Executive Summary.....</b>	<b>1</b>
<b>2. Product Description and Application.....</b>	<b>1</b>
<b>3. Market Study, Plant Capacity and Production Program.....</b>	<b>2</b>
3.1 Market Study.....	2
3.1.1 Present Demand and Supply.....	2
3.1.2 Projected Demand.....	2
3.1.3 Pricing and Distribution.....	3
3.2 Plant Capacity.....	4
3.3 Production Program.....	4
<b>4. Raw Materials and Utilities.....</b>	<b>4</b>
4.1 Availability and Source of Raw materials.....	4
4.2 Annual Requirement and Cost of Raw Materials and Utilities.....	4
<b>5 Location and Site.....</b>	<b>5</b>
<b>6 Technology and Engineering.....</b>	<b>5</b>
6.1 Production Process.....	5
6.2 Machinery and Equipment.....	6
6.3 Civil Engineering Cost.....	7
<b>7 Human Resource and Training Requirement.....</b>	<b>7</b>
7.1 Human Resource.....	7
7.2 Training Requirement.....	8
<b>8 Financial Analysis.....</b>	<b>8</b>
8.1 Underlying Assumption.....	8
8.2 Investment.....	9
8.3 Production Costs.....	10
8.4 Financial Evaluation.....	10
<b>9 Economic and Social Benefit and Justification.....</b>	<b>11</b>
<b>ANNEXES.....</b>	<b>13</b>

## **1. Executive Summary**

This project profile deals with gemstone production plant in Amhara National Regional State. The following presents the main findings of the study

Demand projection divulges that the international demand for gemstone is very large and is increasing with time. Accordingly, the planned plant is set to produce 400 units of opal annually. The total investment cost of the project including working capital is estimated at Birr 1.42 million and creates 23 jobs and Birr 305.28 thousand 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 44.6% of capacity utilization and it will payback fully the initial investment less working capital in 3 years and 6 months time. The result further shows that the calculated IRR of the project is 20.5% and NPV discounted at 18% is Birr 127,317.79. Nonetheless, the project is moderately sensitive to an increase in the cost of operation.

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

A gemstone or gem, is a piece of attractive mineral, which is used to make jewelry or other adornments when cut and polished. Most gemstones are hard, but some soft minerals are used in jewelry because of their luster or other physical properties that have aesthetic value. The most obvious and attractive feature of gemstones is their color.

In general, stones like ruby, sapphire, emerald, and opal are gemstones where Amhara region (particularly Debre Brehan) is known to have opal in ample quantity. Opal's mineral/chemical

name is hydrated silicon dioxide where the most essential feature of opal is its color, clarity and carat weight. The varieties of opal base color include chocolate, white, yellow, orange, dark red, root beer, and caramel.

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

#### **3.1 Market Study**

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

As stated earlier gemstone is used by the jewelry industry. Processed products of Ethiopia are mainly exported to Europe, America and Asia. In Ethiopia, there are a number of gemstone processing and exporting firms including Ethio-Gemstone and Riftvally Gemstone although a complete list of firms engaged in the sector could not be documented. Nonetheless, in relation to world export figure, the export from Ethiopia is insignificant both in quantity and value.

According to official report of the sector, the total global gemstone exports has been USD 46.4 billion in 2002, USD 48.4 billion in 2003 and USD 57.9 billion in 2004. This suggests the presence of huge and growing demand in the market. Information obtained from Riftvally Gemstone Pvt. Ltd. Co. divulges that the annual sales of the firm is less than 1 million dollar per annum indicating how insignificant (less than 0.02%) the plant is compared to the world demand. On the other hand, studies show that Ethiopian gemstone such as opal is quite unique and different from more common Australian and Mexican opal. This confirms the presence of potential demand provided standard products are delivered to the market.

##### **3.1.2 Projected Demand**

Based on the global export for gemstone stated earlier, demand of the sector can be projected. That is, taking the growth rate in 2003 alone (which is 4.3%) the demand for gemstone for the coming few years can be forecasted as follows.

**Table 1: Projected Demand in the World**

<b>Year</b>	<b>Projected Demand for Gemstone (in Billion USD)</b>
2008	59.7
2009	62.3
2010	64.9
2011	67.8
2012	70.7
2013	73.7

In comparison to this huge figure, it can be argued that the total supply by the envisaged small plant is insignificant. Accordingly, the output of the proposed plant will be easily absorbed into the international market given that the quality and standards are met to the level required by the global market.

### **3.1.3 Pricing and Distribution**

Price of gemstone is determined in the international market and depends on the quality, color, and size among other things. Thus, it is impossible to state all types of opal and the corresponding prices. Nonetheless, the following table shows some of the Ethiopian opals and the price in the international market.

**Table 2: Price of Opal**

<b>Type</b>	<b>Price (in USD)</b>
Chocolate Opal 2.45 carat	9.99
Oval Opal 1carat	9.99

Source: eBay, 2008 (an online trading firm)

This implies that the international price for a good looking opal for 2.45 carat is a little less than Birr 100. This indicates the presence of attractive price for a qualitative product. Accordingly the average selling price for a quality opal to be produced by the envisaged plant is set to be Birr 95 for a 3.35 carat opal with average size of 12x12x4mm, Birr 200 for an 8.5 carat opal with 15x11x9mm size and Birr 270 for 10.1 carat opal with 15x13x8mm size.

### **3.2 Plant Capacity**

Given the presence of ample demand in the export market for processed gemstone as stated earlier and the planned technology, the envisaged plant is set to produce 4,000 units of processed quality opal annually of which 500 units are of 3.35 carat opal, 1500 units 8.5 carat opal and 2,000 units of 10.1 carat opal.

### **3.3 Production Program**

The program is scheduled based on the consideration that the envisaged plant will work 275 days in a year, where the remaining days will be holidays and for maintenance. During the first year of operation the plant will operate at 75 percent capacity and then it grows to 90 percent in the 2<sup>nd</sup> year. The capacity will grow to 100 percent starting from the 3<sup>rd</sup> year. This consideration is developed based on the assumption that market and logistics barriers would take place for the first two years of operation.

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

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

The main raw materials are the raw gem stone and different chemicals that would be used for the production process. The raw stone will be obtained from the land to be rented (leased) while the chemicals will be imported from abroad.

### **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 listed in table 4 here under.

**Table 4 Material and Utility Requirement**

Material and Input	Quantity	Total Cost	
		L.C.	F.C.
<b>Carborendum Powder : 200 mesh</b>	100 kg		10000
<b>Carborendum Powder: 400 mesh</b>	100kg		10500
<b>Carborendum Powder: 600 mesh</b>	50kg		6000
<b>Diamond Powder: 1 micron</b>	500 crt		5500
<b>Diamond Powder: 15 micron</b>	300 crt		4000
<b>Aluminum Oxide</b>	2.3 kg		4500
<b>Tin Oxide</b>	2.3 kg		2000
<b>Cirium Oxide</b>	2.3 kg		1000
<b>Crome Oxide</b>	10		1300
<b>Grinding Laps</b>	12		1600
<b>Precision Drill</b>	12		1000
<b>Total Material Cost</b>			47400
Utility			
Electricity	910000kwh	50000	
Water	550m <sup>3</sup>	1458	
<b>Total Utility Cost</b>		51458	

The total cost of raw material and utility is estimated to be Birr 98,858.

## **5 Location and Site**

The appropriate locations for the envisaged project in view of the availability of adequate raw gemstone (opal) and infrastructure is Debre Berehan.

## **6 Technology and Engineering**

### **6.1 Production Process**

The process generally is grading, cutting and polishing of gemstones that will be obtained from the land to be leased for this purpose. That is, first the roughs come in small rhyolite geodes filled with opal. Then the individual raw stone is examined (graded) and cut into smaller stones along its major line of fracture and inclusions. The smaller pieces are then mounted on cutting tools, which are then faceted on faceting machines. The final operation involves polishing of the faceted stones. Polished stones are then delivered to the customers or sold to the market.

The production technology of gemstone is relatively labor intensive. Thus, the available technological option in the industry is a proportional adjustment of labor and machinery based on the required capacity of production.

## **6.2 Machinery and Equipment**

The following combination of machinery is required for cutting and polishing of 4000 units per year.

**Table 3: Machinery and Equipment**

<b>Machinery and Equipment</b>	<b>Quantity</b>
Trim Saw	2
Facetor	2
Calibrating machines with wheels	2
Dual Edge Grinding Machine	1
Buffing, Sanding and Polishing Sets	1
Gem Pack	3
Faceting Table	1

The total cost of machinery and equipment including freight insurance and bank cost is estimated to be about Birr 300 thousand.

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

### **A. K & Sons**

178, meena bazar, jama masjid, new Delhi 110 006, India

**Phone:** +(91)-(11)-23281561/23288883/23256034

**Website:** <http://www.trademart.in/akandsons.htm>

### **Belatrix Jewels Extraordinaire**

63a johari bazar, jaipur - 302 003, India

**Phone:** +(91)-(141)-2560816/2216282/2564650

**Fax:** +(91)-(141)-2213596

**Website:** <http://www.trademart.in/belatrixjewelsextraordinaire1.htm>

### **Cambridge Time Spares**

**Address:** 79, ebrahim rehmatulla road, near j.j. hospital, mumbai

**City :** mumbai, **Country :** India

**Phone:** 912223702344/23736325

**Fax:** 912223738723

**Website:** <http://www.trademart.in/cambridgetimespares1.htm>

## **6.3 Civil Engineering Cost**

The total site area for the envisaged plant is estimated to be 300m<sup>2</sup> where 200m<sup>2</sup> is allocated to the production place and the remaining space is left for stores (50m<sup>2</sup>), office buildings and facilities (50m<sup>2</sup>).

# **7 Human Resource and Training Requirement**

## **7.1 Human Resource**

The list of 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	4000	48000
Supervisor	1	2000	24000
Accounts/Administration	1	2000	24000
Secretary	1	800	9600
Sales Clerk	2	800	19200
Store Keeper	1	800	9600
Operators	8	800	76800
Laborers	2	400	9600
Cleaners	2	400	9600
Driver	1	800	9600
Guards	3	400	14400
Benefit (20%)			50880
<b>Total</b>	<b>23</b>		<b>305280</b>

The envisaged plant creates 23 job opportunity and about Birr 305.28 thousand 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 existing firms in the region such as Ethio-Gemstone. The training should primarily focus on the production technology and machinery maintenance and trouble shooting. Birr 10,000 will be allocated as training expense.

# **8 Financial Analysis**

## **8.1 Underlying Assumption**

The financial analysis of gemstone producing plant is based on the data provided in the preceding sections and the following assumptions.

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

Construction 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 1.42 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	2,900		2,900
Building and civil works	600,000		600,000
Office equipment	50,000		50,000
Vehicles	250,000		250,000
Plant machinery & equipment	50,000	300,000	350,000
<i>Total fixed investment cost</i>	<i>952,900</i>	<i>300,000</i>	<i>1,252,900</i>
Pre production capital expenditure*	62,645		62,645
<i>Total initial investment</i>	<i>1,015,545</i>	<i>300,000</i>	<i>1,315,545</i>
Working capital at full capacity	90,628	20,684	111,312
<b>Total</b>	<b>1,106,173</b>	<b>320,684</b>	<b>1,426,857</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 investment account for 22.5% of the total outlay

### 8.3 Production Costs

The total production cost at full capacity operation is estimated at Birr 659.8 thousand as detailed in table 6 below.

**Table 6: Production Cost**

<b>Items</b>	<b>Cost</b>
1. Raw materials	47,400
2. Utilities	51,458
3. Wages and Salaries	305,280
4. Spares and Maintenance	37,587
<b>Factory costs</b>	<b>441,725</b>
5. Depreciation	132,529
6. Financial costs	85,611
<b>Total Production Cost</b>	<b>659,865</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 second year of operation. Ratios such as the percentage of net profit to total sales, return on equity and return on total investment are 23%, 32% and 20% respectively in the second year and are gradually rising. 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 44.6% of capacity utilization.

#### *III. Payback Period*

Investment cost and income statement projection are used in estimating the project payback period. The projects will payback fully the initial investment less working capital in 3 years and 6 months.

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

For the envisaged plant the simple rate of return equals to 17.4%

#### *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 20.5% and the net present value at 18 % discount is Birr 127,317.79

#### *VI. Sensitivity Analysis*

The envisaged plant is slightly sensitive to a 10 percent increase in cost of production. That is, it will force the pay back period to be 3 years and 8 months.

## **9 Economic and Social Benefit and Justification**

The envisaged project possesses wide range of socio-economic benefits. Accordingly it promotes the goals and objectives stated in the strategic plan of the Amhara National Regional State. It plays positive role in diversifying the economic activity by improving the industrial sector that make use of the natural recourses of the region. The other major benefits are listed as follows:

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

The project is found to be financially viable and earns a profit of Birr 2.06 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 813.8 thousand 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. Foreign Exchange Creation***

Based on the projected figure we learn that in the project life an estimated amount of 805 thousand US dollars will be generated from the export sales. This will create room for the obtained hard currency to be allocated on to other vital and strategic sectors

### ***D. Employment and Income Generation***

The proposed project is expected to create employment opportunity to several citizens of the region. That is, it will provide permanent employment to 23 professionals as well as support staff. Consequently the project creates income of Birr 305.28 thousand 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**

<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	75%	90%	100%	100%
<b>1. Total Inventory</b>	0.00	0.00	69808.91	83770.69	93078.55	93078.55
<b>Raw Materials in Stock- Total</b>	0.00	0.00	15512.73	18615.27	20683.64	20683.64
<b>Raw Material-Local</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>Raw Material-Foreign</b>	0.00	0.00	15512.73	18615.27	20683.64	20683.64
<b>Factory Supplies in Stock</b>	0.00	0.00	469.84	563.81	626.46	626.46
<b>Spare Parts in Stock and Maintenance</b>	0.00	0.00	3075.30	3690.36	4100.40	4100.40
<b>Work in Progress</b>	0.00	0.00	11746.10	14095.33	15661.47	15661.47
<b>Finished Products</b>	0.00	0.00	23492.21	28190.65	31322.95	31322.95
<b>2. Accounts Receivable</b>	0.00	0.00	72613.64	87136.36	96818.18	96818.18
<b>3. Cash in Hand</b>	0.00	0.00	29187.65	35025.19	38916.87	38916.87
<b>CURRENT ASSETS</b>	0.00	0.00	156097.48	187316.97	208129.97	208129.97
<b>4. Current Liabilities</b>	0.00	0.00	72613.64	87136.36	96818.18	96818.18
<b>Accounts Payable</b>	0.00	0.00	72613.64	87136.36	96818.18	96818.18
<b>TOTAL NET WORKING CAPITAL REQUIREMENTS</b>	0.00	0.00	83483.84	100180.61	111311.79	111311.79
<b>INCREASE IN NET WORKING CAPITAL</b>	0.00	0.00	83483.84	16696.77	11131.18	0.00

## 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>	93078.55	93078.55	93078.55	93078.55	93078.55	93078.55
<b>Raw Materials in Stock-Total</b>	20683.64	20683.64	20683.64	20683.64	20683.64	20683.64
<b>Raw Material-Local</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>Raw Material-Foreign</b>	20683.64	20683.64	20683.64	20683.64	20683.64	20683.64
<b>Factory Supplies in Stock</b>	626.46	626.46	626.46	626.46	626.46	626.46
<b>Spare Parts in Stock and Maintenance</b>	4100.40	4100.40	4100.40	4100.40	4100.40	4100.40
<b>Work in Progress</b>	15661.47	15661.47	15661.47	15661.47	15661.47	15661.47
<b>Finished Products</b>	31322.95	31322.95	31322.95	31322.95	31322.95	31322.95
<b>2. Accounts Receivable</b>	96818.18	96818.18	96818.18	96818.18	96818.18	96818.18
<b>3. Cash in Hand</b>	38916.87	38916.87	38916.87	38916.87	38916.87	38916.87
<b>CURRENT ASSETS</b>	208129.97	208129.97	208129.97	208129.97	208129.97	208129.97
<b>4. Current Liabilities</b>	96818.18	96818.18	96818.18	96818.18	96818.18	96818.18
<b>Accounts Payable</b>	96818.18	96818.18	96818.18	96818.18	96818.18	96818.18
<b>TOTAL NET WORKING CAPITAL REQUIREMENTS</b>	111311.79	111311.79	111311.79	111311.79	111311.79	111311.79
<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>	657772.50	769084.29	738238.64	813272.73	897181.82	887500.00
<b>1. Inflow Funds</b>	657772.50	769084.29	72613.64	14522.73	9681.82	0.00
<b>Total Equity</b>	263109.00	307633.71	0.00	0.00	0.00	0.00
<b>Total Long Term Loan</b>	394663.50	461450.57	0.00	0.00	0.00	0.00
<b>Total Short Term Finances</b>	0.00	0.00	72613.64	14522.73	9681.82	0.00
<b>2. Inflow Operation</b>	0.00	0.00	665625.00	798750.00	887500.00	887500.00
<b>Sales Revenue</b>	0.00	0.00	665625.00	798750.00	887500.00	887500.00
<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>	657772.50	657772.50	706279.01	658487.85	745903.89	713105.29
<b>4. Increase In Fixed Assets</b>	657772.50	657772.50	0.00	0.00	0.00	0.00
<b>Fixed Investments</b>	626450.00	626450.00	0.00	0.00	0.00	0.00
<b>Pre-production Expenditures</b>	31322.50	31322.50	0.00	0.00	0.00	0.00
<b>5. Increase in Current Assets</b>	0.00	0.00	156097.48	31219.50	20813.00	0.00
<b>6. Operating Costs</b>	0.00	0.00	320366.91	381848.99	422837.04	422837.04
<b>7. Corporate Tax Paid</b>	0.00	0.00	0.00	0.00	73956.77	79093.45
<b>8. Interest Paid</b>	0.00	0.00	229814.62	102733.69	85611.41	68489.13
<b>9. Loan Repayments</b>	0.00	0.00	0.00	142685.68	142685.68	142685.68
<b>10. Dividends Paid</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>Surplus(Deficit)</b>	0.00	111311.79	31959.63	154784.88	151277.93	174394.71
<b>Cumulative Cash Balance</b>	0.00	111311.79	143271.42	298056.30	449334.23	623728.93

<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>	887500.00	887500.00	887500.00	887500.00	887500.00	887500.00
<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>	887500.00	887500.00	887500.00	887500.00	887500.00	887500.00
<b>Sales Revenue</b>	887500.00	887500.00	887500.00	887500.00	887500.00	887500.00
<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>	701119.70	707892.80	695907.20	541235.93	541235.93	541235.93
<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>	422837.04	422837.04	422837.04	422837.04	422837.04	422837.04
<b>7. Corporate Tax Paid</b>	84230.13	108125.52	113262.20	118398.89	118398.89	118398.89
<b>8. Interest Paid</b>	51366.84	34244.56	17122.28	0.00	0.00	0.00
<b>9. Loan Repayments</b>	142685.68	142685.68	142685.68	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>	186380.30	179607.20	191592.80	346264.07	346264.07	346264.07
<b>Cumulative Cash Balance</b>	810109.23	989716.43	1181309.23	1527573.30	1873837.37	2220101.45

<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	665625.00	798750.00	887500.00	887500.00
<b>1. Inflow Operation</b>	0.00	0.00	665625.00	798750.00	887500.00	887500.00
<b>Sales Revenue</b>	0.00	0.00	665625.00	798750.00	887500.00	887500.00
<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>	657772.50	657772.50	403850.74	398545.75	507924.98	501930.49
<b>3. Increase in Fixed Assets</b>	657772.50	657772.50	0.00	0.00	0.00	0.00
<b>Fixed Investments</b>	626450.00	626450.00	0.00	0.00	0.00	0.00
<b>Pre-production Expenditures</b>	31322.50	31322.50	0.00	0.00	0.00	0.00
<b>4. Increase in Net Working Capital</b>	0.00	0.00	83483.84	16696.77	11131.18	0.00
<b>5. Operating Costs</b>	0.00	0.00	320366.91	381848.99	422837.04	422837.04
<b>6. Corporate Tax Paid</b>	0.00	0.00	0.00	0.00	73956.77	79093.45
<b>NET CASH FLOW</b>	-657772.50	-657772.50	261774.26	400204.25	379575.02	385569.51
<b>CUMMULATIVE NET CASH FLOW</b>	-657772.50	-1315545.00	-1053770.74	-653566.50	-273991.48	111578.03
<b>Net Present Value (at 18%)</b>	-657772.50	-557434.32	188002.19	243576.66	195780.57	168535.99
<b>Cumulative Net present Value</b>	-657772.50	-1215206.82	-1027204.63	-783627.97	-587847.40	-419311.41

<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>	887500.00	887500.00	887500.00	887500.00	887500.00	887500.00
<b>1. Inflow Operation</b>	887500.00	887500.00	887500.00	887500.00	887500.00	887500.00
<b>Sales Revenue</b>	887500.00	887500.00	887500.00	887500.00	887500.00	887500.00
<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>	507067.17	530962.56	536099.24	541235.93	541235.93	541235.93
<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>	422837.04	422837.04	422837.04	422837.04	422837.04	422837.04
<b>6. Corporate Tax Paid</b>	84230.13	108125.52	113262.20	118398.89	118398.89	118398.89
<b>NET CASH FLOW</b>	380432.83	356537.44	351400.76	346264.07	346264.07	346264.07
<b>CUMMULATIVE NET CASH FLOW</b>	492010.85	848548.29	1199949.05	1546213.12	1892477.19	2238741.27
<b>Net Present Value (at 18%)</b>	140924.32	111926.03	93486.01	78067.34	66158.76	56066.75
<b>Cumulative Net present Value</b>	-278387.09	-166461.07	-72975.05	5092.28	71251.04	127317.79
<b>Net Present Value (at 18%)</b>	<b>127,317.79</b>					
<b>Internal Rate of Return</b>	<b>20.5%</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>	75%	90%	100%	100%	100%
<b>1. Total Income</b>	665625.00	798750.00	887500.00	887500.00	887500.00
<b>Sales Revenue</b>	665625.00	798750.00	887500.00	887500.00	887500.00
<b>Other Income</b>	0.00	0.00	0.00	0.00	0.00
<b>2. Less Variable Cost</b>	215826.41	258991.69	287768.54	287768.54	287768.54
<b>VARIABLE MARGIN</b>	449798.60	539758.31	599731.46	599731.46	599731.46
<b>(In % of Total Income)</b>	67.58	67.58	67.58	67.58	67.58
<b>3. Less Fixed Costs</b>	237069.50	255386.30	267597.50	267597.50	267597.50
<b>OPERATIONAL MARGIN</b>	212729.10	284372.01	332133.96	332133.96	332133.96
<b>(In % of Total Income)</b>	32	36	37	37	37
<b>4. Less Cost of Finance</b>	229814.62	102733.69	85611.41	68489.13	51366.84
<b>5. GROSS PROFIT</b>	-17085.53	181638.33	246522.55	263644.83	280767.12
<b>6. Income (Corporate) Tax</b>	0.00	0.00	73956.77	79093.45	84230.13
<b>7. NET PROFIT</b>	-17085.53	181638.33	172565.79	184551.38	196536.98
<b>RATIOS (%)</b>					
<b>Gross Profit/Sales</b>	-3%	23%	28%	30%	32%
<b>Net Profit After Tax/Sales</b>	-3%	23%	19%	21%	22%
<b>Return on Investment</b>	15%	20%	18%	18%	17%
<b>Return on Equity</b>	-3%	32%	30%	32%	34%

<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>	887500.00	887500.00	887500.00	887500.00	887500.00
<b>Sales Revenue</b>	887500.00	887500.00	887500.00	887500.00	887500.00
<b>Other Income</b>	0.00	0.00	0.00	0.00	0.00
<b>2. Less Variable Cost</b>	287768.54	287768.54	287768.54	287768.54	287768.54
<b>VARIABLE MARGIN</b>	599731.46	599731.46	599731.46	599731.46	599731.46
<b>(In % of Total Income)</b>	68	68	68	68	68
<b>3. Less Fixed Costs</b>	205068.50	205068.50	205068.50	205068.50	205068.50
<b>OPERATIONAL MARGIN</b>	394662.96	394662.96	394662.96	394662.96	394662.96
<b>(In % of Total Income)</b>	44	44	44	44	44
<b>4. Less Cost of Finance</b>	34244.56	17122.28	0.00	0.00	0.00
<b>5. GROSS PROFIT</b>	360418.40	377540.68	394662.96	394662.96	394662.96
<b>6. Income (Corporate) Tax</b>	108125.52	113262.20	118398.89	118398.89	118398.89
<b>7. NET PROFIT</b>	252292.88	264278.47	276264.07	276264.07	276264.07
<b>RATIOS (%)</b>					
<b>Gross Profit/Sales</b>	41%	43%	44%	44%	44%
<b>Net Profit After Tax/Sales</b>	28%	30%	31%	31%	31%
<b>Return on Investment</b>	20%	20%	19%	19%	19%
<b>Return on Equity</b>	44%	46%	48%	48%	48%

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

	CONSTRUCTION		PRODUCTION			
	Year 1	Year 2	1	2	3	4
<b>TOTAL ASSETS</b>	657772.50	1426856.79	1499470.42	1535860.27	1575422.19	1617287.90
<b>1. Total Current Assets</b>	0.00	111311.79	299368.89	485373.27	657464.19	831858.90
Inventory on Materials and Supplies	0.00	0.00	19057.87	22869.45	25410.50	25410.50
Work in Progress	0.00	0.00	11746.10	14095.33	15661.47	15661.47
Finished Products in Stock	0.00	0.00	23492.21	28190.65	31322.95	31322.95
Accounts Receivable	0.00	0.00	72613.64	87136.36	96818.18	96818.18
Cash in Hand	0.00	0.00	29187.65	35025.19	38916.87	38916.87
Cash Surplus, Finance Available	0.00	111311.79	143271.42	298056.30	449334.23	623728.93
Securities	0.00	0.00	0.00	0.00	0.00	0.00
<b>2. Total Fixed Assets, Net of Depreciation</b>	657772.50	1315545.00	1183016.00	1050487.00	917958.00	785429.00
Fixed Investment	0.00	626450.00	1252900.00	1252900.00	1252900.00	1252900.00
Construction in Progress	626450.00	626450.00	0.00	0.00	0.00	0.00
Pre-Production Expenditure	31322.50	62645.00	62645.00	62645.00	62645.00	62645.00
Less Accumulated Depreciation	0.00	0.00	132529.00	265058.00	397587.00	530116.00
<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	17085.53	0.00	0.00	0.00
<b>TOTAL LIABILITIES</b>	657772.50	1426856.79	1499470.42	1535860.27	1575422.19	1617287.90
<b>5. Total Current Liabilities</b>	0.00	0.00	72613.64	87136.36	96818.18	96818.18
Accounts Payable	0.00	0.00	72613.64	87136.36	96818.18	96818.18
Bank Overdraft	0.00	0.00	0.00	0.00	0.00	0.00
<b>6. Total Long-term Debt</b>	394663.50	856114.07	856114.07	713428.39	570742.71	428057.04
Loan A	394663.50	856114.07	856114.07	713428.39	570742.71	428057.04
Loan B	0.00	0.00	0.00	0.00	0.00	0.00
<b>7. Total Equity Capital</b>	263109.00	570742.71	570742.71	570742.71	570742.71	570742.71
Ordinary Capital	263109.00	570742.71	570742.71	570742.71	570742.71	570742.71
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	-17085.53	164552.80	337118.58
<b>9. Net Profit After Tax</b>	0.00	0.00	0.00	181638.33	172565.79	184551.38
Dividends Payable	0.00	0.00	0.00	0.00	0.00	0.00
Retained Profits	0.00	0.00	0.00	181638.33	172565.79	184551.38

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

	PRODUCTION					
	5	6	7	8	9	10
<b>TOTAL ASSETS</b>	1671139.20	1780746.40	1902339.20	2178603.27	2454867.34	2731131.41
<b>1. Total Current Assets</b>	1018239.20	1197846.40	1389439.20	1735703.27	2081967.34	2428231.41
Inventory on Materials and Supplies	25410.50	25410.50	25410.50	25410.50	25410.50	25410.50
Work in Progress	15661.47	15661.47	15661.47	15661.47	15661.47	15661.47
Finished Products in Stock	31322.95	31322.95	31322.95	31322.95	31322.95	31322.95
Accounts Receivable	96818.18	96818.18	96818.18	96818.18	96818.18	96818.18
Cash in Hand	38916.87	38916.87	38916.87	38916.87	38916.87	38916.87
Cash Surplus, Finance Available	810109.23	989716.43	1181309.23	1527573.30	1873837.37	2220101.45
Securities	0.00	0.00	0.00	0.00	0.00	0.00
<b>2. Total Fixed Assets, Net of Depreciation</b>	652900.00	582900.00	512900.00	442900.00	372900.00	302900.00
Fixed Investment	1252900.00	1252900.00	1252900.00	1252900.00	1252900.00	1252900.00
Construction in Progress	0.00	0.00	0.00	0.00	0.00	0.00
Pre-Production Expenditure	62645.00	62645.00	62645.00	62645.00	62645.00	62645.00
Less Accumulated Depreciation	662645.00	732645.00	802645.00	872645.00	942645.00	1012645.00
<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>	1671139.20	1780746.40	1902339.20	2178603.27	2454867.34	2731131.41
<b>5. Total Current Liabilities</b>	96818.18	96818.18	96818.18	96818.18	96818.18	96818.18
Accounts Payable	96818.18	96818.18	96818.18	96818.18	96818.18	96818.18
Bank Overdraft	0.00	0.00	0.00	0.00	0.00	0.00
<b>6. Total Long-term Debt</b>	285371.36	142685.68	0.00	0.00	0.00	0.00
Loan A	285371.36	142685.68	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>	570742.71	570742.71	570742.71	570742.71	570742.71	570742.71
Ordinary Capital	570742.71	570742.71	570742.71	570742.71	570742.71	570742.71
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>	521669.97	718206.95	970499.83	1234778.30	1511042.37	1787306.45
<b>9. Net Profit After Tax</b>	196536.98	252292.88	264278.47	276264.07	276264.07	276264.07
Dividends Payable	0.00	0.00	0.00	0.00	0.00	0.00
Retained Profits	196536.98	252292.88	264278.47	276264.07	276264.07	276264.07