

Investment Office ANRS

**PROJECT PROFILE ON THE ESTABLISHMENT
OF ESSENTIAL OILS PRODUCING PLANT**

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1. Executive Summary

This project profile is prepared in order to provide general information on the opportunity for an investor to setup a steam distillation unit for extraction of essential oil from Eucalyptus Globulus which would be specially grown for this purpose.

Demand projection divulges that the domestic demand for essential oil is substantial and is increasing with time. Accordingly, the planned plant is set to produce 120 tons annually. The total investment cost of the project including working capital is estimated at Birr 4.22 million and creates 51 jobs and Birr 624,960 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 16.8% of capacity utilization and it will payback fully the initial investment less working capital in one year and 9 months. The result further shows that the calculated IRR of the project is 54.4% and the net present value at 18 % discount is Birr 7,306,834.92.

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 import substitution.

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

An essential oil is an aromatic volatile substance. It is named after the French word 'essence', (not the English word 'essential'). It is extracted by distillation from a single botanical species. Essential oils are obtained from blossoms, seeds, fruits, fruit peels, leaves, stems, barks, wood, roots, and plant secretions.

Essential oils are found in hundreds of products but are generally used as odorants, flavorants, and pharmaceutical ingredients. As odorants, they are used in perfumes, lotions and other cosmetics, soaps, detergents, and other products ranging from animal feed to insecticides. As flavorants, they are present in a wide variety of foods, including soft drinks, baked products, ice creams, candy, confections, etc. As pharmaceutical ingredients, essential oils are used in dental products such as toothpaste, aromatherapy and phytotherapy products, and a large number of medicines.

3. Market Study, Plant Capacity and Production Program

3.1 Market Study

3.1.1 Present Demand and Supply

Currently industrial demand for essential oil is met through import. There is also Essential Oils Research Centre that has its head office and the main laboratory in Addis Ababa and an agricultural research station, laboratory and a small-scale production unit at Wondo Genet, (about 267 km south of Addis Ababa). In addition to this, some firms are engaged in processing and export of some specific types of essential oil. This includes Ariti Herbal Private Company, Aromabyssinia Plc and Cheleleka Edible Oil Factory.

On the other hand various types of essential oil are imported to Ethiopia which can be categorized under some major groups according to their application. These are for: Perfumery, Pharmaceutical, Cosmetics, Toiletries, and Confectionery industry.

However, detail data of essential oil for each sub section could not be obtained. But it can be asserted that much of the demand is derived from the toiletries, and confectionery industries given the relatively more production in these sectors.

Nonetheless, the supply of essential oil is derived from import mainly from India Germany, Ireland, Italy, South Africa, Great Britain and China (Customs Authority, various years). The total import demand for the oil is presented in the following table.

Table 1: Import of Essential Oils (Effective Demand)

Year	Import (in ton)
1997/98	339.5
1998/99	335.7
1999/00	301.2
2000/01	332.9
2001/02	448.4
2002/03	532.3
2003/04	590
2004/05	738.3
2005/06	914.2
2006/07	952.7

Source: Customs Authority, (various yeas)

The above table shows that annual demand for essential oil has increased by almost three fold within the last ten years under consideration. Such huge increase is a result of expansion of the industrial sector that makes use of essential oil. Relatedly, on average Birr 62.7 million (more than USD 6 million) has been allocated every year to import the oil. This presents the existence of huge demand for the product and the burden it is exerting on the country's foreign exchange reserve.

3.1.2 Projected Demand

The future demand for essential oil very much depends on the growth of the industrial sector. However, since all industrial production processes do not use essential oil, the growth of the sector as a whole could not be used. But, since the growth of industrial outputs that make use of essential oil (such as food industry, soap industry, etc) is related with the growth of the urban population growth rate, population based forecast can be made. Accordingly, it is conservatively assumed that the demand for essential oil grows at 3% per year to obtain the following projected demand.

Table 2: Projected Demand for Essential Oil

Year	Projected Demand
2007/08	981
2008/09	1,011
2009/10	1,041
2010/11	1,072
2011/12	1,104
2012/13	1,138
2013/14	1,172
2014/15	1,207
2015/16	1,243
2016/17	1,280
2017/18	1,319
2018/19	1,358

The forecasted result indicates that demand for essential oil will be higher than 1000 tons beginning from 2008/09 and points out the importance of local production that can relieve to some extent the import demand.

3.1.3 Pricing and Distribution

The CIF value of essential oil has been on average Birr 80 per kg in 1997/98 and has grown to Birr 137 in 2006/07. The price charged by local distributors is further higher as duties, inland transportation etc will be added on the CIF value. In order to compete with imported products and in view of the capacity of the envisaged plant, the whole sale price of the product has been estimated at Birr 75 per kg. The product will be distributed directly to the firms that use essential oil in their production as the number of firms that demand the product are limited.

3.2 Plant Capacity

Given the projected demand presented earlier, and the planned technology, the envisaged plant is set to produce 120 tons of essential oil annually that would be used mainly by the soap industry and other toiletry products. This capacity is about 11.5% of the demand projected in 2009/10 and it further decreases as time goes by.

3.3 Production Program

The program is scheduled based on the consideration that the envisaged plant will work 275 days in a year in 2 shifts, 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 to 60 percent in the 2nd year and 80 percent in the 3rd year. The capacity will grow to 100 percent starting from the 4th year. This consideration is developed based on the assumption that market and logistics barriers would take place for the first three years of operation.

4. Raw Materials and Utilities

4.1 Availability and Source of Raw Materials

Essential oil industry is an agro based industry. Accordingly, the envisaged plant will use Eucalyptus Globulus tree as the main raw material. This is available in large quantity in Dessie, Gonder, Debre Birhan and Bahir Dar. (Forest Resource Potential Report, DSA/SCI, 2007). However, this profile is developed based on the consideration that the envisaged plant will use eucalyptus tree which would be specially grown by the firm for this purpose. The tree shall be planted in one of the major eucalyptus growing areas mentioned above and adjacent to the processing plant.

Eucalyptus globulus is harvested one year after planting. The total plant is cut (the practice is known as coppicing) and the leaves are utilized for distillation. Coppicing stimulates a vigorous sprouting of side branches and results in regular increase in leaf yield. In this case there is no need to plant new trees. Eucalyptus globulus is raised through seeds only. Cultivation is done by raising the seedlings at a nursery or direct seeding in a well-prepared field. The seedlings can be raised in the higher beds or directly in polythene bags. When seedlings are 30 cm high, the seedlings are transplanted with a ball of earth (after removing the polythene) without disturbing the root at a predetermined space. A spacing of 1–1.5 m between rows and 0.75–1 m between plants is normally practiced. The oil content (in the leaves) varies from 0.8 to 1 percent. Over 100 kg of oil can be obtained from a hectare.

4.2 Annual Requirement and Cost of Raw Materials and Utilities

For a project which will grow its own eucalyptus globulus, the full capacity requirement of material and utilities and the associated cost are presented in table 3 below.

Table 3 Material and Utility Requirement

Material and Input	Quantity	Total Cost	
		L.C.	F.C.
Plastic Drum (30kg capacity)	4,000	300,000	
Total Material Cost		300,000	
Utility			
Electricity	68,220 kwh	37,521	
Furnace Oil	460,000 lit	3,220,000	
Water	10,000 m ³	26,500	
Total Utility Cost		3,284,021	

The total material and utility cost at full capacity operation is Birr 3,584,021.

5. Location and Site

The appropriate locations for the envisaged project in view of the input, infrastructure as well as market for the output are any rural place very near to the major towns such as Dessie, Gonder, Debre Birhan and Bahir Dar.

6. Technology and Engineering

6.1 Production Process

The most appropriate production process of essential oil production from the leaves of eucalyptus globulus plant is steam distillation.

Generally speaking steam distillation is the most common method of extracting essential oils. First, fresh or sometimes dried, botanical material is placed in the plant chamber of the still and pressurized steam is generated in a separate chamber and circulated through the plant material. The heat of the steam forces the tiny intercellular pockets that hold the essential oils to open and release them. The temperature of the steam must be high

enough to open the pouches, yet not so high that it destroys the plants or burns the essential oils. As they are released, the tiny droplets of essential oil evaporate and, together with the steam molecules, travel through a tube into the still's condensation chamber. As the steam cools, it condenses into water. The essential oil forms a film on the surface of the water. To separate the essential oil from the water, the film is then decanted or skimmed off the top. The remaining water, a byproduct of distillation, is called floral water, distillate, or hydrosol.

There are alternative ways of producing essential oils. These are Cold Pressing or Cold Compression (which is mainly used to obtain citrus fruit oils), and Solvent Extraction (a method of extraction used on delicate plants). However, for the eucalyptus globulus, steam distillation is more appropriate.

6.2 Machinery and Equipment

The machineries and equipment required for producing essential oils are detailed in table 4 below.

Table 4: Machinery and Equipment

Machinery and Equipment	Quantity
De-ionizing Machine	1
Steam Generator	1
Distillation Unit (Still, Condenser, and Florentine flask)	1
Laboratory Equipment	set

The total cost of machinery and equipment including freight insurance and bank cost is estimated to be about Birr 950,000.

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

Arnab Biotech

30/B, Lenin Sarani, Kolkata - 700 013, India

Phone: +(91)-(33)-22448472

Fax: +(91)-(33)-28430741

Website: <http://www.indiamart.com/company/594028>

Pharmac Technologies Private Limited

J 137, Ansa Industrial Estate, Saki Vihar Road,

Andheri (East), Mumbai - 400 072, India

Phone: +(91)-(22)-66935781 Fax: +(91)-(22)-66935781

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

6.3 Civil Engineering Cost

As stated earlier, the envisaged plant will have its own input production farm (eucalyptus globulus tree) in a rural place near to the major towns. Usually 100 kg of oil is extracted from a hectare of land per year. Thus, to produce 120 tons of oil per annum, the proposed plant will acquire about 1200 hectare (i.e. 12 square kilometer) in rent. In addition to this, a building that approximately covers 300 m² of which 200m² is allocated for the production place and the remaining space left for stores (50m²), office buildings and facilities (50m²) is required.

7. Human Resource and Training Requirement

7.1 Human Resource

The list of required manpower for the envisaged plant is stated in table 5 below.

Table 5: Human Resource Requirement

Position	No. Required	Monthly Salary	Total Annual Salary
Manager	1	4500	54000
Production Manager	1	4000	48000
Administrator/Finance Head	1	3000	36000
Accountant	1	1500	18000
Secretary	2	1000	24000
Marketing Officer	1	1500	18000
Chemist	1	1500	18000
Store Keeper	1	800	9600
Technician	1	1200	14400
Supervisor	2	1500	36000
Operators	10	800	96000
Daily Laborers	20	400	96000
Cleaners	1	400	4800
Driver	2	800	19200
Guards	6	400	28800
Benefit (20%)			104160
Total	51		624,960

The envisaged plant therefore, creates 51 jobs and about Birr 624,960 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 the suppliers of the plant machineries. The training should primarily focus on the production technology and machinery maintenance and trouble shooting. Birr 40,000 will be allocated for training expense.

8. Financial Analysis

8.1 Underlying Assumption

The financial analysis of essential oil 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 4.22 million as shown in table 6 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 6: Total initial investment

Items	L.C	F.C	Total
Land Rent	96,000		96,000
Building and civil works	600,000		600,000
Office equipment	50,000		50,000
Vehicles	1,500,000		1,500,000
Plant machinery & equipment		950,000	950,000
<i>Total fixed investment cost</i>	<i>2,246,000</i>	<i>950,000</i>	<i>3,196,000</i>
Pre production capital expenditure*	112,300		159,800
<i>Total initial investment</i>	<i>2,358,300</i>	<i>950,000</i>	<i>3,355,800</i>
Working capital at full capacity	864,834		864,834
Total	3,223,134	950,000	4,220,634

**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 22.5% of the total investment cost.

8.3 Production Costs

The total production cost at full capacity operation is estimated at Birr 5.43 million as detailed in table 7 below.

Table 7: Production Cost

Items	Cost
1. Raw materials	300,000
2. Utilities	3,284,021
3. Wages and Salaries	624,960
4. Spares and Maintenance	95,880
<i>Factory costs</i>	<i>4,304,861</i>
5. Depreciation	461,960
6. Financial costs	664,859
<i>Total Production Cost</i>	<i>5,431,680</i>

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 17.85%, 38.06% and 35.32% respectively in the first 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 16.8% of capacity utilization.

III. Payback Period

Investment cost and income statement projections are used in estimating the project payback period. The project will payback fully the initial investment less working capital in 1 year and 9 months.

IV. Simple Rate of Return

For the envisaged plant the simple rate of return equals to 70%.

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 54.4% and the net present value at 18 % discount is Birr 7,306,834.92.

VI. Sensitivity Analysis

The envisaged plant is 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. This result is accompanied by more or less unchanged IRR and payback period.

9. Economic and Social Benefits and Justification

The envisaged project possesses wide range of benefits that help promote the socio-economic goals and objectives stated in the strategic plan of the Amhara National Regional State. It also boosts inter sectoral linkage between the agricultural and industrial sectors. 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 2.58 million per year and Birr 25.82 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 9.95 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. Import Substitution and Foreign Exchange Saving

Based on the projected figure we learn that in the project life an estimated amount of US Dollar 7.9 million will be saved as a result of the proposed project. This will create room for the saved hard currency to be allocated 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 51 professionals as well as support staff. Consequently the project creates income of Birr 624,960 per year. This would be one of the commendable accomplishments of the project.

E. Environmental Impact

The proposed production process of essential oil does not pose any environmental problem. However, the use of eucalyptus tree has got its own limitation. This is because planting eucalyptus tree can cause ecological problems since the trees absorb huge quantities of water and prevent the growth of native plants. To mitigate this problem the plantation shall be conducted in areas where native plants are rarely found. At the same time, however, the use of eucalyptus tree can be beneficial for drying up marshy areas and so reducing the risk of malaria.

F. Diversification and InterSectoral linkage.

The proposed project helps to diversify ANRS' and Ethiopian economy. It contributes to industrialization of the region as well as the county's economy.

ANNEXES

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

	CONSTRUCTION		PRODUCTION			
	Year 1	Year 2	1	2	3	4
Capacity Utilization (%)	0	0	40%	60%	80%	100%
1. Total Inventory	0.00	0.00	188450.79	282676.19	376901.58	471126.98
Raw Materials in Stock- Total	0.00	0.00	13090.91	19636.36	26181.82	32727.27
Raw Material-Local	0.00	0.00	13090.91	19636.36	26181.82	32727.27
Raw Material-Foreign	0.00	0.00	0.00	0.00	0.00	0.00
Factory Supplies in Stock	0.00	0.00	2080.07	3120.10	4160.13	5200.17
Spare Parts in Stock and Maintenance	0.00	0.00	4183.85	6275.78	8367.71	10459.64
Work in Progress	0.00	0.00	52001.68	78002.53	104003.37	130004.21
Finished Products	0.00	0.00	104003.37	156005.05	208006.73	260008.42
2. Accounts Receivable	0.00	0.00	392727.27	589090.91	785454.55	981818.18
3. Cash in Hand	0.00	0.00	170573.72	255860.57	341147.43	426434.29
CURRENT ASSETS	0.00	0.00	738660.87	1107991.31	1477321.74	1846652.18
4. Current Liabilities	0.00	0.00	392727.27	589090.91	785454.55	981818.18
Accounts Payable	0.00	0.00	392727.27	589090.91	785454.55	981818.18
TOTAL NET WORKING CAPITAL REQUIRMENTS	0.00	0.00	345933.60	518900.40	691867.20	864834.00
INCREASE IN NET WORKING CAPITAL	0.00	0.00	345933.60	172966.80	172966.80	172966.80

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	471126.98	471126.98	471126.98	471126.98	471126.98	471126.98
Raw Materials in Stock-Total	32727.27	32727.27	32727.27	32727.27	32727.27	32727.27
Raw Material-Local	32727.27	32727.27	32727.27	32727.27	32727.27	32727.27
Raw Material-Foreign	0.00	0.00	0.00	0.00	0.00	0.00
Factory Supplies in Stock	5200.17	5200.17	5200.17	5200.17	5200.17	5200.17
Spare Parts in Stock and Maintenance	10459.64	10459.64	10459.64	10459.64	10459.64	10459.64
Work in Progress	130004.21	130004.21	130004.21	130004.21	130004.21	130004.21
Finished Products	260008.42	260008.42	260008.42	260008.42	260008.42	260008.42
2. Accounts Receivable	981818.18	981818.18	981818.18	981818.18	981818.18	981818.18
3. Cash in Hand	426434.29	426434.29	426434.29	426434.29	426434.29	426434.29
CURRENT ASSETS	1846652.18	1846652.18	1846652.18	1846652.18	1846652.18	1846652.18
4. Current Liabilities	981818.18	981818.18	981818.18	981818.18	981818.18	981818.18
Accounts Payable	981818.18	981818.18	981818.18	981818.18	981818.18	981818.18
TOTAL NET WORKING CAPITAL REQUIRMENTS	864834.00	864834.00	864834.00	864834.00	864834.00	864834.00
INCREASE IN NET WORKING CAPITAL	0.00	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	1677900.00	2542734.00	3992727.27	5596363.64	7396363.64	9196363.64
1. Inflow Funds	1677900.00	2542734.00	392727.27	196363.64	196363.64	196363.64
Total Equity	671160.00	1017093.60	0.00	0.00	0.00	0.00
Total Long Term Loan	1006740.00	1525640.40	0.00	0.00	0.00	0.00
Total Short Term Finances	0.00	0.00	392727.27	196363.64	196363.64	196363.64
2. Inflow Operation	0.00	0.00	3600000.00	5400000.00	7200000.00	9000000.00
Sales Revenue	0.00	0.00	3600000.00	5400000.00	7200000.00	9000000.00
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	1677900.00	1677900.00	3234139.91	3777229.01	5463368.02	6563845.58
4. Increase In Fixed Assets	1677900.00	1677900.00	0.00	0.00	0.00	0.00
Fixed Investments	1598000.00	1598000.00	0.00	0.00	0.00	0.00
Pre-production Expenditures	79900.00	79900.00	0.00	0.00	0.00	0.00
5. Increase in Current Assets	0.00	0.00	738660.87	369330.44	369330.44	369330.44
6. Operating Costs	0.00	0.00	1830619.68	2681949.53	3533279.37	4384609.21
7. Corporate Tax Paid	0.00	0.00	0.00	0.00	885456.78	1185252.11
8. Interest Paid	0.00	0.00	664859.35	303885.65	253238.04	202590.43
9. Loan Repayments	0.00	0.00	0.00	422063.40	422063.40	422063.40
10. Dividends Paid	0.00	0.00	0.00	0.00	0.00	0.00
Surplus(Deficit)	0.00	864834.00	758587.37	1819134.63	1932995.62	2632518.05
Cumulative Cash Balance	0.00	864834.00	1623421.36	3442555.99	5375551.60	8008069.66

Annex 2: Cash Flow Statement (in Birr): Continued						
	PRODUCTION					
	5	6	7	8	9	10
TOTAL CASH INFLOW	9000000.00	9000000.00	9000000.00	9000000.00	9000000.00	9000000.00
1. Inflow Funds	0.00	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	0.00	0.00	0.00	0.00	0.00	0.00
2. Inflow Operation	9000000.00	9000000.00	9000000.00	9000000.00	9000000.00	9000000.00
Sales Revenue	9000000.00	9000000.00	9000000.00	9000000.00	9000000.00	9000000.00
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	6159061.82	6223196.50	6187743.17	5730226.45	5730226.45	5730226.45
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	0.00	0.00	0.00	0.00	0.00	0.00
6. Operating Costs	4384609.21	4384609.21	4384609.21	4384609.21	4384609.21	4384609.21
7. Corporate Tax Paid	1200446.39	1315228.67	1330422.95	1345617.24	1345617.24	1345617.24
8. Interest Paid	151942.82	101295.22	50647.61	0.00	0.00	0.00
9. Loan Repayments	422063.40	422063.40	422063.40	0.00	0.00	0.00
10.Dividends Paid	0.00	0.00	0.00	0.00	0.00	0.00
Surplus(Deficit)	2840938.18	2776803.50	2812256.83	3269773.55	3269773.55	3269773.55
Cumulative Cash Balance	10849007.83	13625811.34	16438068.16	19707841.72	22977615.27	26247388.82

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	3600000.00	5400000.00	7200000.00	9000000.00
1. Inflow Operation	0.00	0.00	3600000.00	5400000.00	7200000.00	9000000.00
Sales Revenue	0.00	0.00	3600000.00	5400000.00	7200000.00	9000000.00
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	1677900.00	1677900.00	2176553.28	2854916.33	4591702.94	5742828.12
3. Increase in Fixed Assets	1677900.00	1677900.00	0.00	0.00	0.00	0.00
Fixed Investments	1598000.00	1598000.00	0.00	0.00	0.00	0.00
Pre-production Expenditures	79900.00	79900.00	0.00	0.00	0.00	0.00
4. Increase in Net Working Capital	0.00	0.00	345933.60	172966.80	172966.80	172966.80
5. Operating Costs	0.00	0.00	1830619.68	2681949.53	3533279.37	4384609.21
6. Corporate Tax Paid	0.00	0.00	0.00	0.00	885456.78	1185252.11
NET CASH FLOW	-1677900.00	-1677900.00	1423446.72	2545083.67	2608297.06	3257171.88
CUMMULATIVE NET CASH FLOW	-1677900.00	-3355800.00	-1932353.28	612730.39	3221027.45	6478199.33
Net Present Value (at 18%)	-1677900.00	-1421949.15	1022297.27	1549016.50	1345330.60	1423739.85
Cumulative Net present Value	-1677900.00	-3099849.15	-2077551.88	-528535.39	816795.22	2240535.07

Annex 3: DISCOUNTED CASH FLOW-TOTAL CAPITAL INVESTED (Continued)						
	PRODUCTION					
	5	6	7	8	9	10
TOTAL CASH INFLOW	9000000.00	9000000.00	9000000.00	9000000.00	9000000.00	9000000.00
1. Inflow Operation	9000000.00	9000000.00	9000000.00	9000000.00	9000000.00	9000000.00
Sales Revenue	9000000.00	9000000.00	9000000.00	9000000.00	9000000.00	9000000.00
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	5585055.60	5699837.88	5715032.16	5730226.45	5730226.45	5730226.45
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	0.00	0.00	0.00	0.00	0.00	0.00
5. Operating Costs	4384609.21	4384609.21	4384609.21	4384609.21	4384609.21	4384609.21
6. Corporate Tax Paid	1200446.39	1315228.67	1330422.95	1345617.24	1345617.24	1345617.24
NET CASH FLOW	3414944.40	3300162.12	3284967.84	3269773.55	3269773.55	3269773.55
CUMMULATIVE NET CASH FLOW	9893143.73	13193305.85	16478273.68	19748047.24	23017820.79	26287594.34
Net Present Value (at 18%)	1265003.11	1036003.50	873926.81	737190.30	624737.54	529438.59
Cumulative Net present Value	3505538.18	4541541.68	5415468.49	6152658.79	6777396.33	7306834.92
Net Present Value (at 18%)	7,306,834.92					
Internal Rate of Return	54.42%					

Annex 4: NET INCOME STATEMENT (in Birr)					
	PRODUCTION				
	1	2	3	4	5
Capacity Utilization (%)	40%	60%	80%	100%	100%
1. Total Income	3600000.00	5400000.00	7200000.00	9000000.00	9000000.00
Sales Revenue	3600000.00	5400000.00	7200000.00	9000000.00	9000000.00
Other Income	0.00	0.00	0.00	0.00	0.00
2. Less Variable Cost	1602666.08	2403999.13	3205332.17	4006665.21	4006665.21
VARIABLE MARGIN	1997333.92	2996000.87	3994667.83	4993334.79	4993334.79
(In % of Total Income)	55.48	55.48	55.48	55.48	55.48
3. Less Fixed Costs	689913.60	739910.40	789907.20	839904.00	839904.00
OPERATIONAL MARGIN	1307420.32	2256090.47	3204760.63	4153430.79	4153430.79
(In % of Total Income)	36.32	41.78	44.51	46.15	46.15
4. Less Cost of Finance	664859.35	303885.65	253238.04	202590.43	151942.82
5. GROSS PROFIT	642560.96	1952204.83	2951522.59	3950840.36	4001487.97
6. Income (Corporate) Tax	0.00	0.00	885456.78	1185252.11	1200446.39
7. NET PROFIT	642560.96	1952204.83	2066065.81	2765588.25	2801041.58
RATIOS (%)					
Gross Profit/Sales	17.85%	36.15%	40.99%	43.90%	44.46%
Net Profit After Tax/Sales	17.85%	36.15%	28.70%	30.73%	31.12%
Return on Investment	35.32%	58.23%	57.30%	70.33%	69.97%
Return on Equity	38.06%	115.63%	122.38%	163.81%	165.91%

Annex 4: NET INCOME STATEMENT (in Birr):Continued					
	PRODUCTION				
	6	7	8	9	10
Capacity Utilization (%)	100%	100%	100%	100%	100%
1. Total Income	9000000.00	9000000.00	9000000.00	9000000.00	9000000.00
Sales Revenue	9000000.00	9000000.00	9000000.00	9000000.00	9000000.00
Other Income	0.00	0.00	0.00	0.00	0.00
2. Less Variable Cost	4006665.21	4006665.21	4006665.21	4006665.21	4006665.21
VARIABLE MARGIN	4993334.79	4993334.79	4993334.79	4993334.79	4993334.79
(In % of Total Income)	55.48	55.48	55.48	55.48	55.48
3. Less Fixed Costs	507944.00	507944.00	507944.00	507944.00	507944.00
OPERATIONAL MARGIN	4485390.79	4485390.79	4485390.79	4485390.79	4485390.79
(In % of Total Income)	49.84	49.84	49.84	49.84	49.84
4. Less Cost of Finance	101295.22	50647.61	0.00	0.00	0.00
5. GROSS PROFIT	4384095.57	4434743.18	4485390.79	4485390.79	4485390.79
6. Income (Corporate) Tax	1315228.67	1330422.95	1345617.24	1345617.24	1345617.24
7. NET PROFIT	3068866.90	3104320.23	3139773.55	3139773.55	3139773.55
RATIOS (%)					
Gross Profit/Sales	48.71%	49.27%	49.84%	49.84%	49.84%
Net Profit After Tax/Sales	34.10%	34.49%	34.89%	34.89%	34.89%
Return on Investment	75.11%	74.75%	74.39%	74.39%	74.39%
Return on Equity	181.78%	183.88%	185.98%	185.98%	185.98%

Annex 5: Projected Balance Sheet (in Birr)

	CONSTRUCTION		PRODUCTION			
	Year 1	Year 2	1	2	3	4
TOTAL ASSETS	1677900.00	4220634.00	5255922.23	6982427.30	8822793.35	11362681.83
1. Total Current Assets	0.00	864834.00	2362082.23	4550547.30	6852873.35	9854721.83
Inventory on Materials and Supplies	0.00	0.00	19354.83	29032.25	38709.66	48387.08
Work in Progress	0.00	0.00	52001.68	78002.53	104003.37	130004.21
Finished Products in Stock	0.00	0.00	104003.37	156005.05	208006.73	260008.42
Accounts Receivable	0.00	0.00	392727.27	589090.91	785454.55	981818.18
Cash in Hand	0.00	0.00	170573.72	255860.57	341147.43	426434.29
Cash Surplus, Finance Available	0.00	864834.00	1623421.36	3442555.99	5375551.60	8008069.66
Securities	0.00	0.00	0.00	0.00	0.00	0.00
2. Total Fixed Assets, Net of Depreciation	1677900.00	3355800.00	2893840.00	2431880.00	1969920.00	1507960.00
Fixed Investment	0.00	1598000.00	3196000.00	3196000.00	3196000.00	3196000.00
Construction in Progress	1598000.00	1598000.00	0.00	0.00	0.00	0.00
Pre-Production Expenditure	79900.00	159800.00	159800.00	159800.00	159800.00	159800.00
Less Accumulated Depreciation	0.00	0.00	461960.00	923920.00	1385880.00	1847840.00
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	1677900.00	4220634.00	5255922.23	6982427.30	8822793.35	11362681.83
5. Total Current Liabilities	0.00	0.00	392727.27	589090.91	785454.55	981818.18
Accounts Payable	0.00	0.00	392727.27	589090.91	785454.55	981818.18
Bank Overdraft	0.00	0.00	0.00	0.00	0.00	0.00
6. Total Long-term Debt	1006740.00	2532380.40	2532380.40	2110317.00	1688253.60	1266190.20
Loan A	1006740.00	2532380.40	2532380.40	2110317.00	1688253.60	1266190.20
Loan B	0.00	0.00	0.00	0.00	0.00	0.00
7. Total Equity Capital	671160.00	1688253.60	1688253.60	1688253.60	1688253.60	1688253.60
Ordinary Capital	671160.00	1688253.60	1688253.60	1688253.60	1688253.60	1688253.60
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	642560.96	2594765.79	4660831.60
9. Net Profit After Tax	0.00	0.00	642560.96	1952204.83	2066065.81	2765588.25
Dividends Payable	0.00	0.00	0.00	0.00	0.00	0.00
Retained Profits	0.00	0.00	642560.96	1952204.83	2066065.81	2765588.25

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

	PRODUCTION					
	5	6	7	8	9	10
TOTAL ASSETS	13741660.01	16388463.51	19070720.34	22210493.89	25350267.45	28490041.00
1. Total Current Assets	12695660.01	15472463.51	18284720.34	21554493.89	24824267.45	28094041.00
Inventory on Materials and Supplies	48387.08	48387.08	48387.08	48387.08	48387.08	48387.08
Work in Progress	130004.21	130004.21	130004.21	130004.21	130004.21	130004.21
Finished Products in Stock	260008.42	260008.42	260008.42	260008.42	260008.42	260008.42
Accounts Receivable	981818.18	981818.18	981818.18	981818.18	981818.18	981818.18
Cash in Hand	426434.29	426434.29	426434.29	426434.29	426434.29	426434.29
Cash Surplus, Finance Available	10849007.83	13625811.34	16438068.16	19707841.72	22977615.27	26247388.82
Securities	0.00	0.00	0.00	0.00	0.00	0.00
2. Total Fixed Assets, Net of Depreciation	1046000.00	916000.00	786000.00	656000.00	526000.00	396000.00
Fixed Investment	3196000.00	3196000.00	3196000.00	3196000.00	3196000.00	3196000.00
Construction in Progress	0.00	0.00	0.00	0.00	0.00	0.00
Pre-Production Expenditure	159800.00	159800.00	159800.00	159800.00	159800.00	159800.00
Less Accumulated Depreciation	2309800.00	2439800.00	2569800.00	2699800.00	2829800.00	2959800.00
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	13741660.01	16388463.51	19070720.34	22210493.89	25350267.45	28490041.00
5. Total Current Liabilities	981818.18	981818.18	981818.18	981818.18	981818.18	981818.18
Accounts Payable	981818.18	981818.18	981818.18	981818.18	981818.18	981818.18
Bank Overdraft	0.00	0.00	0.00	0.00	0.00	0.00
6. Total Long-term Debt	844126.80	422063.40	0.00	0.00	0.00	0.00
Loan A	844126.80	422063.40	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	1688253.60	1688253.60	1688253.60	1688253.60	1688253.60	1688253.60
Ordinary Capital	1688253.60	1688253.60	1688253.60	1688253.60	1688253.60	1688253.60
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	7426419.86	10227461.43	13296328.33	16400648.56	19540422.11	22680195.67
9. Net Profit After Tax	2801041.58	3068866.90	3104320.23	3139773.55	3139773.55	3139773.55
Dividends Payable	0.00	0.00	0.00	0.00	0.00	0.00
Retained Profits	2801041.58	3068866.90	3104320.23	3139773.55	3139773.55	3139773.55