Investment Office ANRS

PROJECT PROFILE ON THE ESTABLISHMENT OF PARTICLE BOARD PRODUCING PLANT

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1. Executive Summary

This project profile is conducted to investigate the viability of establishing particle board producing plant in Amhara National Regional State. The following presents the main findings of the study.

Particle board is made from eucalyptus tree, wood chips, saw dust etc and bonded by resins. It is made in standard sizes. The main users of particle board are the building industry and the furniture industry.

Demand projection pointed out that the annual domestic demand for particle board increases with urbanization and modernization. Accordingly, due to the presence of high demand for the product, the envisaged plant is set to produce 20,000 tons of particle board annually. The total investment cost of the project including working capital is estimated at Birr 14 million. Relatedly, the envisaged plant creates 48 jobs and Birr 604,800 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 27.7% of capacity utilization and it will payback fully the initial investment less working capital in 3 years. The result further shows that the calculated IRR of the project is 24.3% with NPV of Birr 3,293,915.88.
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

Particle boards are substitute of solid and ply wood. Due to the growing deforestation, the natural wood is becoming more and more scarce. This calls for development of an alternative material such as Particle Board. It is made from eucalyptus tree, wood chips, saw dust etc and bonded by resins. Particle Boards are made in standard sizes with thicknesses of 12, 16 and 18mm. The

Boards are having better properties such as high density, high surface hardness, abrasion resistance, high durability etc. Particle Boards may also be covered with veneers or sunmica for special purposes.

The main users of particle board are the building industry and the furniture industry. Particle boards are used as cheaper substitute of wood in the manufacture of various furniture items like (i) cupboards, shutters & wardrobes (ii), door and window panels, (iii) shelves, cabinets, table tops and show cases, (iv) various covering of large surfaces such as partitions and side basic floors. It is also used as sealing tiles. Due to this, it has got very good scope for marketing. Most of the above items are used in bulk by furniture industry.

3. Market Study, Plant Capacity and Production Program

3.1 Market Study

3.1.1 Present Demand and Supply

As stated earlier the major end users of particle board are the building construction sector. Thus the demand for particle board is related to the expansion and growth of the building construction sector. A study conducted by PACO/WASS in 1995 revealed that the yearly requirement of new residential building units is estimated to be 22,000 for Addis Ababa and 121,000 for other urban towns. In other words, the study shows that an annual demand for dwelling units in the urban Ethiopia amounts to 144,100 units. If we conservatively assume that one-fourth of this requirement will be realized, the annual effective demand for residential buildings amounts to 36,025 units. Moreover, according to the latest Statistical Abstracts of the Central Statistical Agency (2006), from 2002/03 up to 2004/05, 2242 building permits for up to 15 storey buildings had been given in Addis Ababa only. Assuming that the construction will be completed within specified period; it represents an addition to the housing demand in the country. Furthermore, it should be noted that as the proportion of middle and high income groups of the urban people increases, the demand is expected to increase as well.

Particle boards have also other application in furniture industries such as Cupboards, wardrobe, table tops, shelves and cabinets. Therefore, it is assumed that the furniture industries consume about 30 percent of the particle board production for producing the above stated goods.

Currently there are two particle board factories in Addis Ababa which have been operating since 1970. They use Eucalyptus globules as the main raw material. They are also integrated with saw milling and pre-fabricated housing. In Amhara region there is no particle board producing plant. However, a recent study revealed that there are about 424 micro wood based enterprises in the region (DSA/SCI, March 2007). This shows the presence of ample demand in the region for processed woods and the presence of raw material as saw dust is one component of the production process.

The domestic production and import of particle board for the last 10 is shown in table 1 below

Table 1: Domestic Production and Import of Particle Board: in Cub M (M^3)

Year	Domestic	Import	Total
1997/98 (1990 FY)	8,308	15,375	23,683
1998/99 (1991 FY)	9,298	20,240	29,538
1999/00 (1992 FY)	7,200	20,606	27,806
2000/01 (1993 FY)	10,289	34,257	44,546
2001/02 (1994 FY)	747	42,740	43,487
2002/03 (1995 FY)	2,231	39,634	41,865
2003/04 (1996 FY)	7950	32,193	40,143
2004/05 (1997 FY)	1300	34,583	35,883
2005/06 (1998 FY)	2079	50,734	52,813
2006/07 (1999 FY)	2204	57595	59,799
AVERAGE	5161	34796	39,956

Source: *CSA and Customs Authority, (various years)*

It is important to note that the import figure of particle board is stated in kilogram while the standard measurement is in cubic meter. Inspection conducted by the consultant team divulges that one cubic meter particle board weighs on average 80 kilograms. Hence, the import data of particle board is translated from kilogram into cubic meter using a conversion rate of one cubic meter particle board is on average equivalent to 80 kg.

As shown in table 1 above, the average domestic production for the ten years under review had been 5,161m^3. The effective current demand for particle board in 2006/07 on the other hand, had been 59,799m^3. In other words domestic production covers less than 10 percent of the total demand, pointing the huge dependency on imported products.

3.1.2 Demand Projection

The future demand for particle board is related to housing construction and the furniture industry whose future growth is related to the growth rate of the economy and urbanization. The rate of urbanization in the country is currently above 5 percent and the economy is growing on average at about 10%. In view of this real performance, a conservative assumption that demand for particle board will grow by 3 percent is considered in projecting the future demand. Accordingly, the projected demand for particle board is given in table 2 below.

Table 2: Projected demand for particle board (m^3)

Year	Projected Demand
2007/08	61593
2008/09	63441
2009/10	65344
2010/11	67304
2011/12	69323
2012/13	71403
2013/14	73545
2014/15	75751
2015/16	78024
2016/17	80365
2017/18	82776
2018/19	85259

As shown in table 2 above the demand for particle board reaches 65.3 thousand cubic meter in 2009/10 and further increases by 30.5% within 10 years (2018/19). This indicates the presence of huge demand in the future and hence affirms the importance of establishing a plant that manufactures particle board.

3.1.3 Pricing and Distribution

Currently the rtai1 price for particle board ranges from Birr 220 up to 340 for standard sizes (2.2cmX1.5cm). The product is currently distributed through retail networks. The envisaged plant should use the same channel of distribution as no major is problem observed in the current network. The whole sale price for the envisaged plant is set to be Birr 160 for 12mm, Birr 215 for 16mm and Birr 260 for 18mm particle board.

3.2 Plant capacity

The annual production capacity of the proposed plant is estimated to be 20,000m^3 of particle board. This constitutes less than one-third of the projected demand stated in table 2 above. In view of the market analysis conducted, the product mix for the plant under consideration is set at 5,000m^3 for 12mm thick boards, 8,000 m^3 for 16mm thick boards and 7,000 m^3 for 18mm thick boards. The production capacity is based on two shifts a day and 275 working days a year. The production program does not include Sundays, national and public holidays.

3.3 Production Programmer

The production programme is designed in such a way that the plant will initially produce at 70 percent of its rated capacity in the first year of its operation. During the second year of operation, the plant will produce at 80 percent, and 90 percent in the third year. The envisaged plant will produce at 100 percent of its rated capacity beginning from the fourth year. Capacity build-up is set up considering the time required for training of operators, machine training, logistics and market barriers.

4. Raw Materials and Utilities

4.1 Availability and Source of Raw Materials

The basic raw materials in the production of particle board are eucalyptus tree, waste woods, wood chips, saw dust, phenol Formaldehyde/Urea, Formaldehyde resins, veneers and sunmica coverings. Eucalyptus tree is adequately available in the region. Moreover, wood chips and saw dusts can be acquired from saw mills operating in the region, adjacent regions and the country at large. On the other hand Phenol Formaldehyde/Urea, Formaldehyde resins, Veneers and Sunmica coverings are imported from abroad.

4.2 Annual Requirement and Cost of Raw Materials and Utilities

The annual requirements of raw materials and utilities for the production of 10,000 m^3 of particle boards and the corresponding costs are indicated in Table 3 below

Table 3: Raw Materials and Utilities

Materials and Utilities	**Quantity**	**Total Cost**	
Materials		**L.C**	**F.C**
Eucalyptus tree, Waste Woods, Wood chips	35 ton	350,000	
Saw Dust	5 tone	30,000	
Phenol Formaldehyde/Urea, Formaldehyde Resins	4 tone		320,000
Veneers and Sunmica Coverings	35 tone		650,000
Total raw materials		***380,000***	***970,000***
Utilities			
1. Electricity	150,000 kwh	82,500	
2. Water	55,000 m^3	145,750	
3. Furnace oil	150,000 lit	1,050,000	
Total utilities		***1,278,250***	

* LC = local cost and FC = foreign cost

The total raw material is Birr 1,350,000 while the cost of utility for the envisaged plant at full capacity of operation is estimated to be Birr 1.28 million. Thus the total input cost amounts to Birr 2,628,250

5. Location and Site

Debre Tabor town is the most appropriate location for the envisaged project as the plant has to be near the availability of eucalyptus tree forest.

6. Technology and Engineering

6.1 Production Process

The salient and distinctive features of the production process are stated herein. In the first stage, eucalyptus tree, waste woods etc are crushed in the disintegrator up to complete powder stage. This powder is further mixed with phenol formaldehyde/urea formaldehyde resins in mixing

drum. This mixture of resin and powder is spread over the die formats of required sizes and thickness. This spread is hot pressed by hydraulic press machine so that the particle boards are formed. The edges are formed by trimming machine. Some of the particle boards are coated by veneers or sunmica as per the requirements to give it a better surface glass.

The alternative technological option employs an extrusion process. In the manufacture of extruded particle board, it is common to include plastic (typically scrap plastic) in the blend of starting material. This process is most useful for the production of long lengths of material such as floor boards and planking. However, due to the relatively large proportion of plastic contained in the material (typically approximately 50%), the properties of the final material are rather like those of a plastic filled with an additive rather than those of a particle board. Thus, the above stated option is not adopted by the proposed plant.

6.2 Machinery and Equipment

Production machineries and equipment required for particle board production are indicated in Table 4 below.

Table 4: List of Machinery and Equipment

Machinery	Quantity
1. Disintegrator with 15 HP Motor	1
2. Cemented pit for disintegrated particle collection	1
3. Vibratory separator with two screen fitted with 2 HP Motor	1
4. Resin Mixture drum capacity 500 liters	1
5. Mat forming sheets/dies, formats	1
6. Hydraulic Hot Press capacity 300 psi	1
7. Trimming Band Sawing Machine	1
8. Steam Boiler	1

The total cost of machinery and equipment including freight insurance and bank cost is estimated to be Birr 8.5 million.

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

AMBICA HYDRAULICS PVT. LTD.
502, SHEFALI CENTRE, PRITAM RAI MARG,
PALDI CHAR RASTA, AHMEDABAD
380006, GUJARAT, INDIA
Phone : 91-79-26579899/26579399
Mobile : +919426600610
Fax : 91-79-26578357

L. M. ENGINEERING COMPANY
321, LAKE TOWN, BLOCK 'A', KOLKATA
700089, WEST BENGAL, INDIA
Phone : 91-33-25349929/25343760
Mobile : +919830051872
Fax : 91-33-25343760

6.3 Civil Engineering Cost

The total site area for the proposed plant is envisaged to be 1,500m^2. The production hall shall occupy 1000m^2 and the remaining 500m^2 shall be allocated to office building, stores (raw material and finished), and facilities. The lay out of the plant should be structured in a manner that facilitates the production process.

7. Human Resource and Training Requirement

7.1 Human Resource

Manpower requirements and the corresponding compensation for the plant are as indicated in table 5.

Table 5: Manpower requirements

Position	No. Required	Monthly Salary	Total Annual salary
Plant manager	1	4,000	48000
Technologist	1	2500	30000
Engineer	1	2500	30000
Administrator/Finance Head	1	2000	24000
Accountant	2	1000	24000
Secretary	2	850	20400
Supervisor	2	1000	24000
Operators	10	600	72000
Laborer	4	300	14400
Technician	2	1000	24000
Clerks	2	600	14400
Driver	3	600	21600
Messenger	1	300	3600
Cleaner	2	300	7200
Guards	4	300	14400
20% Benefit			74400
Total	38		446400

The envisaged plant will creates 38 jobs and Birr 446.4 thousand of income The professionals and support staff for the envisaged plant are available in the Amhara region

7.2 Training Requirement

Training of key personnel shall be conducted in collaboration with the suppliers of the plant machineries. The practical training of key personnel shall be given in ECAFCO, Addis Ababa. The training should primarily focus on the production technology and machinery maintenance and trouble shooting. Birr 50,000 is allocated as training expense.

8. Financial Analysis

8.1 Underlying Assumption

The financial analysis of particleboard is based on the data provided in the preceding discussions 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 days
Raw Material-Foreign	120 days
Factory Supplies in Stock	30 days
Spare Parts in Stock and Maintenance	30 days
Work in Progress	10 days
Finished Products	15 days
Accounts Receivable	30 days
Cash in Hand	30 days
Accounts Payable	30 days

8.2 Investment

The total investment cost of the project including working capital is estimated at Birr 13.8 million as detailed in table 6 below. The Owners 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 (in Birr)

Items	L.C	F.C	Total
Land	4,500		4,500
Building and civil works	3,000,000		3,000,000
Office equipment	60,000		60,000
Vehicles	600,000		600,000
Plant machinery & equipment	1,500,000	7,000,000	8,500,000
Total fixed investment cost	5,164,500	7,000,000	12,164,500
Pre production capital expenditure*	608,225		608,225
Total initial investment	5,772,725	7,000,000	12,772,725
Working capital at full capacity	637,852	423,273	1,061,125
Total	6,410,577	7,423,273	13,833,850

**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, pre-production marketing*

The foreign component of the project accounts for 53.7% of the total investment cost.

8.3 Production Costs

The total production cost at full capacity operation is estimated at Birr 5.44 million. This is detailed in table 7 below.

Table 7: Production Cost ('000 Birr)

Items	Cost
1. Raw materials	**1,350,000**
2. Utilities	1,278,250
3. Wages and Salaries	446,400
4. Spares and Maintenance	**121,645**
Factory costs	***3,196,295***
5. Depreciation	**1,247,645**
6. Financial costs	**996,037**
Total Production Cost	***5,439,977***

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. The percentage of net profit after tax to sales, return on investment and return on equity is about 3%, 4 and 18% respectively and it further increases in the subsequent period. In addition to this, 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 27.7% 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 time.

IV. Simple Rate of Return

Simple rate of return refers to the ratio of net profit plus interest to the total capital invested for a single year at full capacity operation. Accordingly, for the envisaged plant the return amounts to 21.6%.

V. Internal Rate of Return and Net Present Value

Based on cash flow statement the calculated IRR of the project is 24.3% and the net present value at 18 % discount is Birr 3,293,915.88.

VI. Sensitivity Analysis

The envisaged plant is slightly sensitive to considerable cost increment. That is, the plant incurs loss of Birr 8,779 in the first year of operation and then maintains to be profitable starting from the second year when 10 % cost increment takes place in the sector. This result is accompanied with payback period of 3 years and 7 months.

9. Economic and Social Benefit and Justification

The envisaged project promotes the socio-economic goals and objectives stated in the strategic plan of the Amhara National Regional State. It boosts the inter sectorial linkage between the agricultural (forestry) 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 a net profit of about Birr 21.5 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 8.5 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

The analysis conducted revealed the presence of strong dependence on imported particle boards. Thus, with the advent of this project a portion of the import burden will be relieved. That is, based on the projected figure we learn that in the project life an estimated amount of US Dollar 8.03 million will be saved as a result of the proposed project. This will create room for the saved hard currency to be used in other vital and strategic sectors.

D. Employment and Income Generation

The proposed project is expected to create employment opportunity to several citizens of the country. That is, it will provide permanent employment to 38 professionals as well as support staff. Consequently the project creates income of Birr 446,400 thousands per year.

E. Pro Environment Project

The proposed production process is environment friendly. Moreover, since processed tree and wood is used in producing the particle board, it plays a positive role in reducing the deforestation tendencies in the region as well as in the country.

ANNEXES

Annex 1: Total Net Working Capital Requirements (in Birr)						
	CONSTRUCTION		PRODUCTION			
	Year 1	Year 2	1	2	3	4
Capacity Utilization (%)	0	0	70%	80%	90%	100%
1. Total Inventory	0.00	0.00	936396.06	1070166.93	1203937.80	1337708.66
Raw Materials in Stock- Total	0.00	0.00	325309.09	371781.82	418254.55	464727.27
Raw Material-Local	0.00	0.00	29018.18	33163.64	37309.09	41454.55
Raw Material-Foreign	0.00	0.00	296290.91	338618.18	380945.45	423272.73
Factory Supplies in Stock	0.00	0.00	3393.55	3878.35	4363.14	4847.93
Spare Parts in Stock and Maintenance	0.00	0.00	27867.76	31848.87	35829.98	39811.09
Work in Progress	0.00	0.00	84838.85	96958.69	109078.53	121198.36
Finished Products	0.00	0.00	169677.71	193917.38	218157.05	242396.73
2. Accounts Receivable	0.00	0.00	652416.16	745618.47	838820.78	932023.09
3. Cash in Hand	0.00	0.00	131700.55	150514.91	169329.27	188143.64
CURRENT ASSETS	0.00	0.00	1395203.68	1594518.49	1793833.30	1993148.12
4. Current Liabilities	0.00	0.00	652416.16	745618.47	838820.78	932023.09
Accounts Payable	0.00	0.00	652416.16	745618.47	838820.78	932023.09
TOTAL NET WORKING CAPITAL REQUIRMENTS	0.00	0.00	742787.52	848900.02	955012.52	1061125.03
INCREASE IN NET WORKING CAPITAL	0.00	0.00	742787.52	106112.50	106112.50	106112.50

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	1337708.66	1337708.66	1337708.66	1337708.66	1337708.66	1337708.66
Raw Materials in Stock-Total	464727.27	464727.27	464727.27	464727.27	464727.27	464727.27
Raw Material-Local	41454.55	41454.55	41454.55	41454.55	41454.55	41454.55
Raw Material-Foreign	423272.73	423272.73	423272.73	423272.73	423272.73	423272.73
Factory Supplies in Stock	4847.93	4847.93	4847.93	4847.93	4847.93	4847.93
Spare Parts in Stock and Maintenance	39811.09	39811.09	39811.09	39811.09	39811.09	39811.09
Work in Progress	121198.36	121198.36	121198.36	121198.36	121198.36	121198.36
Finished Products	242396.73	242396.73	242396.73	242396.73	242396.73	242396.73
2. Accounts Receivable	932023.09	932023.09	932023.09	932023.09	932023.09	932023.09
3. Cash in Hand	188143.64	188143.64	188143.64	188143.64	188143.64	188143.64
CURRENT ASSETS	1993148.12	1993148.12	1993148.12	1993148.12	1993148.12	1993148.12
4. Current Liabilities	932023.09	932023.09	932023.09	932023.09	932023.09	932023.09
Accounts Payable	932023.09	932023.09	932023.09	932023.09	932023.09	932023.09
TOTAL NET WORKING CAPITAL REQUIRMENTS	1061125.03	1061125.03	1061125.03	1061125.03	1061125.03	1061125.03
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	6386362.50	7447487.53	6632897.66	6928038.31	7782392.81	8636747.31
1. Inflow Funds	6386362.50	7447487.53	652416.16	93202.31	93202.31	93202.31
Total Equity	2554545.00	2978995.01	0.00	0.00	0.00	0.00
Total Long Term Loan	3831817.50	4468492.52	0.00	0.00	0.00	0.00
Total Short Term Finances	0.00	0.00	652416.16	93202.31	93202.31	93202.31
2. Inflow Operation	0.00	0.00	5980481.50	6834836.00	7689190.50	8543545.00
Sales Revenue	0.00	0.00	5980481.50	6834836.00	7689190.50	8543545.00
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	6386362.50	6386362.50	5930981.84	5197791.04	6147859.24	6506297.51
4. Increase In Fixed Assets	6386362.50	6386362.50	0.00	0.00	0.00	0.00
Fixed Investments	6082250.00	6082250.00	0.00	0.00	0.00	0.00
Pre-production Expenditures	304112.50	304112.50	0.00	0.00	0.00	0.00
5. Increase in Current Assets	0.00	0.00	1395203.68	199314.81	199314.81	199314.81
6. Operating Costs	0.00	0.00	2307145.08	2619054.02	2930962.96	3242871.90
7. Corporate Tax Paid	0.00	0.00	0.00	0.00	804165.46	1016700.99
8. Interest Paid	0.00	0.00	2228633.08	996037.20	830031.00	664024.80
9.Loan Repayments	0.00	0.00	0.00	1383385.00	1383385.00	1383385.00
10.Dividends Paid	0.00	0.00	0.00	0.00	0.00	0.00
Surplus(Deficit)	0.00	1061125.03	701915.83	1730247.27	1634533.57	2130449.80
Cumulative Cash Balance	0.00	1061125.03	1763040.85	3493288.12	5127821.70	7258271.50

Annex 2: Cash Flow Statement (in Birr): Continued						
	PRODUCTION					
	5	6	7	8	9	10
TOTAL CASH INFLOW	8543545.00	8543545.00	8543545.00	8543545.00	8543545.00	8543545.00
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	8543545.00	8543545.00	8543545.00	8543545.00	8543545.00	8543545.00
Sales Revenue	8543545.00	8543545.00	8543545.00	8543545.00	8543545.00	8543545.00
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	6190778.35	6147067.51	6030863.17	4531273.83	4531273.83	4531273.83
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	3242871.90	3242871.90	3242871.90	3242871.90	3242871.90	3242871.90
7. Corporate Tax Paid	1066502.85	1188798.21	1238600.07	1288401.93	1288401.93	1288401.93
8. Interest Paid	498018.60	332012.40	166006.20	0.00	0.00	0.00
9. Loan Repayments	1383385.00	1383385.00	1383385.00	0.00	0.00	0.00
10.Dividends Paid	0.00	0.00	0.00	0.00	0.00	0.00
Surplus(Deficit)	2352766.65	2396477.49	2512681.83	4012271.17	4012271.17	4012271.17
Cumulative Cash Balance	9611038.15	12007515.63	14520197.46	18532468.63	22544739.80	26557010.97

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	5980481.50	6834836.00	7689190.50	8543545.00
1. Inflow Operation	0.00	0.00	5980481.50	6834836.00	7689190.50	8543545.00
Sales Revenue	0.00	0.00	5980481.50	6834836.00	7689190.50	8543545.00
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	6386362.50	6386362.50	3049932.60	2725166.52	3037075.46	4365685.39
3. Increase in Fixed Assets	6386362.50	6386362.50	0.00	0.00	0.00	0.00
Fixed Investments	6082250.00	6082250.00	0.00	0.00	0.00	0.00
Pre-production Expenditures	304112.50	304112.50	0.00	0.00	0.00	0.00
4. Increase in Net Working Capital	0.00	0.00	742787.52	106112.50	106112.50	106112.50
5. Operating Costs	0.00	0.00	2307145.08	2619054.02	2930962.96	3242871.90
6. Corporate Tax Paid	0.00	0.00	0.00	0.00	804165.46	1016700.99
NET CASH FLOW	-6386362.50	-6386362.50	2930548.90	4109669.48	4652115.04	4177859.61
CUMMULATIVE NET CASH FLOW	-6386362.50	-12772725.00	-9842176.10	-5732506.62	-1080391.58	3097468.02
Net Present Value (at 18%)	-6386362.50	-5412171.61	2104674.59	2501271.72	2399509.18	1826180.94
Cumulative Net present Value	-6386362.50	-11798534.11	-9693859.52	-7192587.80	-4793078.62	-2966897.68

Annex 3: DISCOUNTED CASH FLOW-TOTAL CAPITAL INVESTED (Continued)						
	PRODUCTION					
	5	6	7	8	9	10
TOTAL CASH INFLOW	8543545.00	8543545.00	8543545.00	8543545.00	8543545.00	8543545.00
1. Inflow Operation	8543545.00	8543545.00	8543545.00	8543545.00	8543545.00	8543545.00
Sales Revenue	8543545.00	8543545.00	8543545.00	8543545.00	8543545.00	8543545.00
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	4309374.75	4431670.11	4481471.97	4531273.83	4531273.83	4531273.83
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	3242871.90	3242871.90	3242871.90	3242871.90	3242871.90	3242871.90
6. Corporate Tax Paid	1066502.85	1188798.21	1238600.07	1288401.93	1288401.93	1288401.93
NET CASH FLOW	4234170.25	4111874.89	4062073.03	4012271.17	4012271.17	4012271.17
CUMMULATIVE NET CASH FLOW	7331638.28	11443513.17	15505586.20	19517857.37	23530128.54	27542399.71
Net Present Value (at 18%)	1568470.20	1290820.46	1080666.45	904590.89	766602.45	649663.10
Cumulative Net present Value	-1398427.47	-107607.01	973059.44	1877650.33	2644252.78	3293915.88
Net Present Value (at 18%)	**3,293,915.88**					
Internal Rate of Return	**24.3%**					

Annex 4: NET INCOME STATEMENT (in Birr)					
	PRODUCTION				
	1	2	3	4	5
Capacity Utilization (%)	70%	80%	90%	100%	100%
1. Total Income	5980481.50	6834836.00	7689190.50	8543545.00	8543545.00
Sales Revenue	5980481.50	6834836.00	7689190.50	8543545.00	8543545.00
Other Income	0.00	0.00	0.00	0.00	0.00
2. Less Variable Cost	2058370.58	2352423.52	2646476.46	2940529.40	2940529.40
VARIABLE MARGIN	3922110.92	4482412.48	5042714.04	5603015.60	5603015.60
(In % of Total Income)	65.58	65.58	65.58	65.58	65.58
3. Less Fixed Costs	1496419.50	1514275.50	1532131.50	1549987.50	1549987.50
OPERATIONAL MARGIN	2425691.42	2968136.98	3510582.54	4053028.10	4053028.10
(In % of Total Income)	40.56	43.43	45.66	47.44	47.44
4. Less Cost of Finance	2228633.08	996037.20	830031.00	664024.80	498018.60
5. GROSS PROFIT	197058.34	1972099.78	2680551.54	3389003.30	3555009.50
6. Income (Corporate) Tax	0.00	0.00	804165.46	1016700.99	1066502.85
7. NET PROFIT	197058.34	1972099.78	1876386.08	2372302.31	2488506.65
RATIOS (%)					
Gross Profit/Sales	3%	29%	35%	40%	42%
Net Profit After Tax/Sales	3%	29%	24%	28%	29%
Return on Investment	18%	22%	20%	22%	22%
Return on Equity	4%	36%	34%	43%	45%

Annex 4: NET INCOME STATEMENT (in Birr):Continued					
	PRODUCTION				
	6	7	8	9	10
Capacity Utilization (%)	100%	100%	100%	100%	100%
1. Total Income	8543545.00	8543545.00	8543545.00	8543545.00	8543545.00
Sales Revenue	8543545.00	8543545.00	8543545.00	8543545.00	8543545.00
Other Income	0.00	0.00	0.00	0.00	0.00
2. Less Variable Cost	2940529.40	2940529.40	2940529.40	2940529.40	2940529.40
VARIABLE MARGIN	5603015.60	5603015.60	5603015.60	5603015.60	5603015.60
(In % of Total Income)	65.58	65.58	65.58	65.58	65.58
3. Less Fixed Costs	1308342.50	1308342.50	1308342.50	1308342.50	1308342.50
OPERATIONAL MARGIN	4294673.10	4294673.10	4294673.10	4294673.10	4294673.10
(In % of Total Income)	50.27	50.27	50.27	50.27	50.27
4. Less Cost of Finance	332012.40	166006.20	0.00	0.00	0.00
5. GROSS PROFIT	3962660.70	4128666.90	4294673.10	4294673.10	4294673.10
6. Income (Corporate) Tax	1188798.21	1238600.07	1288401.93	1288401.93	1288401.93
7. NET PROFIT	2773862.49	2890066.83	3006271.17	3006271.17	3006271.17
RATIOS (%)					
Gross Profit/Sales	46%	48%	50%	50%	50%
Net Profit After Tax/Sales	32%	34%	35%	35%	35%
Return on Investment	22%	22%	22%	22%	22%
Return on Equity	50%	52%	54%	54%	54%

Annex 5: Projected Balance Sheet (in Birr)

	CONSTRUCTION		PRODUCTION			
	Year 1	Year 2	1	2	3	4
TOTAL ASSETS	6386362.50	13833850.03	14683324.53	15365241.62	15951445.00	17033564.62
1. Total Current Assets	0.00	1061125.03	3158244.53	5087806.62	6921655.00	9251419.62
Inventory on Materials and Supplies	0.00	0.00	356570.41	407509.04	458447.67	509386.30
Work in Progress	0.00	0.00	84838.85	96958.69	109078.53	121198.36
Finished Products in Stock	0.00	0.00	169677.71	193917.38	218157.05	242396.73
Accounts Receivable	0.00	0.00	652416.16	745618.47	838820.78	932023.09
Cash in Hand	0.00	0.00	131700.55	150514.91	169329.27	188143.64
Cash Surplus, Finance Available	0.00	1061125.03	1763040.85	3493288.12	5127821.70	7258271.50
Securities	0.00	0.00	0.00	0.00	0.00	0.00
2. Total Fixed Assets, Net of Depreciation	6386362.50	12772725.00	11525080.00	10277435.00	9029790.00	7782145.00
Fixed Investment	0.00	6082250.00	12164500.00	12164500.00	12164500.00	12164500.00
Construction in Progress	6082250.00	6082250.00	0.00	0.00	0.00	0.00
Pre-Production Expenditure	304112.50	608225.00	608225.00	608225.00	608225.00	608225.00
Less Accumulated Depreciation	0.00	0.00	1247645.00	2495290.00	3742935.00	4990580.00
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	6386362.50	13833850.03	14683324.53	15365241.62	15951445.00	17033564.62
5. Total Current Liabilities	0.00	0.00	652416.16	745618.47	838820.78	932023.09
Accounts Payable	0.00	0.00	652416.16	745618.47	838820.78	932023.09
Bank Overdraft	0.00	0.00	0.00	0.00	0.00	0.00
6. Total Long-term Debt	3831817.50	8300310.02	8300310.02	6916925.01	5533540.01	4150155.01
Loan A	3831817.50	8300310.02	8300310.02	6916925.01	5533540.01	4150155.01
Loan B	0.00	0.00	0.00	0.00	0.00	0.00
7. Total Equity Capital	2554545.00	5533540.01	5533540.01	5533540.01	5533540.01	5533540.01
Ordinary Capital	2554545.00	5533540.01	5533540.01	5533540.01	5533540.01	5533540.01
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	197058.34	2169158.12	4045544.20
9.Net Profit After Tax	0.00	0.00	197058.34	1972099.78	1876386.08	2372302.31
Dividends Payable	0.00	0.00	0.00	0.00	0.00	0.00
Retained Profits	0.00	0.00	197058.34	1972099.78	1876386.08	2372302.31

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

	PRODUCTION					
	5	6	7	8	9	10
TOTAL ASSETS	18138686.26	19529163.75	21035845.58	24042116.75	27048387.92	30054659.09
1. Total Current Assets	11604186.26	14000663.75	16513345.58	20525616.75	24537887.92	28550159.09
Inventory on Materials and Supplies	509386.30	509386.30	509386.30	509386.30	509386.30	509386.30
Work in Progress	121198.36	121198.36	121198.36	121198.36	121198.36	121198.36
Finished Products in Stock	242396.73	242396.73	242396.73	242396.73	242396.73	242396.73
Accounts Receivable	932023.09	932023.09	932023.09	932023.09	932023.09	932023.09
Cash in Hand	188143.64	188143.64	188143.64	188143.64	188143.64	188143.64
Cash Surplus, Finance Available	9611038.15	12007515.63	14520197.46	18532468.63	22544739.80	26557010.97
Securities	0.00	0.00	0.00	0.00	0.00	0.00
2. Total Fixed Assets, Net of Depreciation	6534500.00	5528500.00	4522500.00	3516500.00	2510500.00	1504500.00
Fixed Investment	12164500.00	12164500.00	12164500.00	12164500.00	12164500.00	12164500.00
Construction in Progress	0.00	0.00	0.00	0.00	0.00	0.00
Pre-Production Expenditure	608225.00	608225.00	608225.00	608225.00	608225.00	608225.00
Less Accumulated Depreciation	6238225.00	7244225.00	8250225.00	9256225.00	10262225.00	11268225.00
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	18138686.26	19529163.75	21035845.58	24042116.75	27048387.92	30054659.09
5. Total Current Liabilities	932023.09	932023.09	932023.09	932023.09	932023.09	932023.09
Accounts Payable	932023.09	932023.09	932023.09	932023.09	932023.09	932023.09
Bank Overdraft	0.00	0.00	0.00	0.00	0.00	0.00
6. Total Long-term Debt	2766770.01	1383385.00	0.00	0.00	0.00	0.00
Loan A	2766770.01	1383385.00	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	5533540.01	5533540.01	5533540.01	5533540.01	5533540.01	5533540.01
Ordinary Capital	5533540.01	5533540.01	5533540.01	5533540.01	5533540.01	5533540.01
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	6417846.51	8906353.16	11680215.65	14570282.48	17576553.65	20582824.82
9. Net Profit After Tax	2488506.65	2773862.49	2890066.83	3006271.17	3006271.17	3006271.17
Dividends Payable	0.00	0.00	0.00	0.00	0.00	0.00
Retained Profits	2488506.65	2773862.49	2890066.83	3006271.17	3006271.17	3006271.17