

**119. PROFILE ON THE PRODUCTION BLUE PRINT
PAPER**

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I. SUMMARY

This profile envisages the establishment of a plant for the production of blue print paper with a capacity of 240 tons per annum. Blue print paper is used to make copies of original technical drawings and related records created by architects, landscape architects, engineers, surveyors, mapmakers and other professionals in building and engineering trades. It is also used for archival preservation.

The demand for blue print paper is met entirely through import. The present (2012) demand for blue print paper is estimated at 1,483 tons. The demand for blue print paper is projected to reach 2,388 tons and 3,846 tons by the year 2017 and 2022, respectively.

The principal raw materials required are ferric ammonium citrate, potassium ferricyanide, base paper, and alkali oxalate which have to be imported.

The total investment cost of the project including working capital is estimated at Birr 13.25 million. From the total investment cost, the highest share (Birr 9.04 million or 68.21%) is accounted by initial working capital followed by fixed investment cost (2.97 million or 22.43%) and pre operation cost (Birr 1.24 million or 9.36%). From the total investment cost, Birr 667.00 thousand or 5.03% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 32.53% and a net present value (NPV) of Birr 21.00 million, discounted at 10%.

The project can create employment for 36 persons. The establishment of such factory will have a foreign exchange saving effect to the country by substituting the current imports. The project will also create forward linkage with the professional services sub sector and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

A blueprint is a type of paper-based reproduction usually of a technical drawing, documenting an architectural or an engineering design. However, the term "blueprint" has almost been completely replaced with drawing, copying or transfer paper in the design and construction industry.

Various base materials have been used for blueprints. Paper was a common choice; for more durable prints linen was sometimes used, but with time, the linen prints would shrink slightly. To combat this problem, printing on imitation vellum and, later, polyester film (Mylar) was implemented.

Architectural reprography, the reprography of architectural drawings, covers a variety of technologies, media, and supports typically used to make multiple copies of original technical drawings and related records created by architects, landscape architects, engineers, surveyors, mapmakers and other professionals in building and engineering trades.

Within the context of archival preservation, the custodians of architectural records must consider many aspects of identification and care when managing the art factual nature of these materials. Storage containers, handling, paper and chemical compositions and interactions, ultraviolet light exposure, humidity, mold, and other agents of potential harm all interact to determine the longevity of these documents. As well, architectural reprographic drawings are often in very large formats, making storage and handling decisions especially complex.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

Blue print paper is supplied to the local market through import. Accordingly, the annual average quantity of imported blue print paper was increasing through time. The import data on Table 3.1

indicates that the average quantity of import during the years (2002-2007) was 490 tons and this has shown a remarkable increase during the years (2008-2011) with an annual average of 1,099 tons. Similarly, the average annual growth rate of import was 16% and 31% during the period (2002-2007) and (2008-2011), respectively. .

In order to estimate the current (2012) effective demand for the product, the average growth rate during the recent four years which is about 31% is expected to be relatively realistic. However, a conservative growth rate estimate of 10% is utilized for the estimation of the present effective demand. Accordingly, the current effective demand for blue print paper is estimated at 1,483 tons. The imported quantity of blue print paper is presented in Table 3.1.

Table 3.1
IMPORTED QUANTITY OF BLUE PRINT PAPER (TONS)

Year	Quantity
2002	305
2003	282
2004	462
2005	622
2006	782
2007	485
2008	774
2009	949
2010	1,327
2011	1,348

Source: - Ethiopian Revenues and Customs Authority.

2. Demand Projection

The demand for blue print paper is directly related to the performance in the design and construction industry. The GDP of the country is growing at an average rate of more than 11%

during the past years and the design and construction sector is one of the fast growing sectors among the different sectors in the economy of the country. According to the Growth and Transformation Plan (GTP), the GDP of the country is planned to grow at a much faster pace than of the past years. However, a growth rate of 10% which is lower than the rate registered during the past years is adopted to project the demand for blue print paper in the future. Hence, the projected demand for the product is presented in Table 3.2.

Table 3.2
PROJECTED DEMAND FOR BLUE PRINT PAPER (TONS)

Year	Projected Demand
2013	1,631
2014	1,794
2015	1,974
2016	2,171
2017	2,388
2018	2,627
2019	2,890
2020	3,179
2021	3,496
2022	3,846

3. Pricing and Distribution

Based on the year 2011, CIF value and subsequent local cost estimates, an ex-factory price of Birr 189 per Kg is recommended for the sales of the product.

The distribution of blueprint paper in the market shall be handled through the existing wholesale and retail stationery enterprise.

B. PLANT CAPACITY AND PRODUCTION PROGRAM

1. Plant Capacity

Considering the economic scale of production, available technology relative to the market demand projection and production management, the annual total production capacity of the plant is set to be 240 tone of blue print paper. The envisaged plant will operate in two shifts eight hours per day for three hundred days within a year considering 13 holidays and 52 Sunday per year and assuming that maintenance activities will be performed during off hours and Sunday

2. Production Program

The nature of manufacturing process of blue print paper is mainly chemical treatment of the base paper which will require the manpower to take little time until they develop a skill and knowledge of the chemical process specification to produce acceptable standard product. So the plant will run in full load after 2 years of its implementation period

Table 3.3

PRODUCTION PROGRAM

Sr. No.	Description	Production Year		
		1	2	3
1	Capacity utilization rate (%)	75	85	100
2	Blue print paper	180.00	204.00	240.00

IV. MATERIALS AND INPUTS

A. RAW MATERIALS

Base paper, ferric ammonium citrate, potassium ferricyanide, and alkali oxalate are the raw materials required for the production of blue print paper, which have to be imported. The quantity of direct and auxiliary raw materials required at full production capacity operation with their related cost is shown in Table 4.1.

Table 4.1
ANNUAL RAW MATERIAL REQUIREMENT & COST

No.	Description	Qty	UOM	Unit Cost (Birr)	Cost (`000 Birr)		
					LC	FC	Total
1	Ferric Ammonium citrate	30	ton	80,000	360.00	2,400.00	2,760.00
2	Potassium Ferricyanide	14	ton	55,000	115.50	770.00	885.50
3	base paper	240	ton	125,000	4500.00	30,000.00	34,500.00
4	Alkali oxalate	12	ton	14,400	25.92	172.80	198.72
Grand Total					5001.42	33,342.80	38,344.22

B. UTILITES

Electricity as a source of energy and water as a solvent and cleaning agent are the utilities required by the plant. Annual cost of utilities is estimated at Birr 300,000. Details of utilities requirement and cost are given in Table 4.2.

Table 4.2
UTILITIES CONSUMPTION & COST

Sr. No.	Description	Quantity	UOM	Unit Cost (Birr)	Cost (`000 Birr)
1	Electricity	200,000	kWh	0.58	116.0
2	Water	18,400	m ³	10	184.0
Total Annual Cost					300.0

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

All blue papers made today has the basic light sensitive compound ferric ammonium oxalate whereas the colour forming compound is a mixture of sodium and potassium ferric cyanide known as Redsol and as a preservative and alkali oxalate or citrate is generally used.

Ferric ammonium citrates and ferric ammonium oxalate either separately or in combination are coated on base sheet along with potassium ferric cyanide as light sensitive salts

The coated sheet is dried in the dark environment because the chemicals are photo reactive state. During the coating process the paper passes over two or three rolls approximately five inches in diameter revolving in a sensitising solution These rolls transfer the liquid on the paper and scares are scraped off with a glass or stainless steel blade and passes to drying box where it heated and dried up to 200 degree centigrade .Then after it is wounded up in 50 to 100 yards rolls where the moisture content is about 3% .followed by wrapping in water proof paper labelled and will be ready for despatch

2. Environmental Impact

The process has ammonia as an effluent from ammonium oxalate and in its gaseous form, ammonia has a short atmospheric lifetime of about 24 hours and usually deposits near its source (the majority of gaseous ammonia is deposited within 700 -1000 m of feedlot perimeters). In particulate form, ammonia can travel much further impacting a larger area. Both gaseous and particulate ammonia contribute to soil acidification, formation of smog and decreased visibility in cities and pristine areas.

Since ammonia is one of the only basic species in the atmosphere, it readily reacts with strong acidic species in the atmosphere such as nitric and sulfuric acids, which are byproducts of combustion

process including vehicle and industrial sources, to form ammonium salts so the envisaged plant will implement a mechanism to prevent a release ammonia in gaseous and liquid state with expense of 250,000 Birr.

B. ENGINEERING

1. Machinery and Equipment

Total cost of machinery and equipment is Birr 800,400, out of which Birr 667,000 is required in foreign currency. The list of direct and auxiliary machinery, tools and equipments required for the plant and their estimated cost is shown in Table 5.1.

Table 5.1
LIST OF MACHINERY & EQUIPMENTS AND COST

No.	Description	Qty	UOM	Unit Cost (Birr)	Cost (`000 Birr)		
					LC	FC	Total (Birr)
1	Mixer for chemicals	1	Pcs	190,000		190	190
2	Coating machine	1	Pcs	270,000		270	270
3	Drier	1	Pcs	126,000		126	126
4	Equipments and tools	1	Set	81,000		81	81
Total Fob Price						667	667
	Port handling, inland transport, insurance etc (20% of FOB)				133.4		133.4
Total Machinery Cost					133.4	667	800.4

2. Land, Building and Civil Works

The total land required by the project is about 800 m², of which 300 m² is built-up area. The cost of building and civil works is estimated at Birr 1,500,000.

According to the Federal Legislation on the Lease Holding of Urban Land (Proclamation No. 721/2004) in principle, urban land permit by lease is on auction or negotiation basis, however,

the time and condition of applying the proclamation shall be determined by the concerned regional or city government depending on the level of development.

The legislation has also set the maximum on lease period and the payment of lease prices. The lease period ranges from 99 years for education, cultural research health, sport, NGO , religious and residential area to 80 years for industry and 70 years for trade while the lease payment period ranges from 10 years to 60 years based on the towns grade and type of investment. Moreover, advance payment of lease based on the type of investment ranges from 5% to 10%.The lease price is payable after the grace period annually. For those that pay the entire amount of the lease will receive 0.5% discount from the total lease value and those that pay in installments will be charged interest based on the prevailing interest rate of banks. Moreover, based on the type of investment, two to seven years grace period shall also be provided.

However, the Federal Legislation on the Lease Holding of Urban Land apart from setting the maximum has conferred on regional and city governments the power to issue regulations on the exact terms based on the development level of each region. In Addis Ababa, the City's Land Administration and Development Authority is directly responsible in dealing with matters concerning land. However, regarding the manufacturing sector, industrial zone preparation is one of the strategic intervention measures adopted by the City Administration for the promotion of the sector and all manufacturing projects are assumed to be located in the developed industrial zones.

Regarding land allocation of industrial zones if the land requirement of the project is below 5,000 m², the land lease request is evaluated and decided upon by the Industrial Zone Development and Coordination Committee of the City's Investment Authority. However, if the land request is above 5,000 m², the request is evaluated by the City's Investment Authority and passed with recommendation to the Land Development and Administration Authority for decision, while the lease price is the same for both cases.

Moreover, the Addis Ababa City Administration has recently adopted a new land lease floor price for plots in the city. The new prices will be used as a benchmark for plots that are going to be auctioned by the city government or transferred under the new "Urban Lands Lease Holding Proclamation."

The new regulation classified the city into three zones. The first Zone is Central Market District Zone, which is classified in five levels and the floor land lease price ranges from Birr 1,686 to Birr 894 per m². The rate for Central Market District Zone will be applicable in most areas of the city that are considered to be main business areas that entertain high level of business activities.

The second zone, Transitional Zone, will also have five levels and the floor land lease price ranges from Birr 1,035 to Birr 555 per m². This zone includes places that are surrounding the city and are occupied by mainly residential units and industries.

The last and the third zone, Expansion Zone, is classified into four levels and covers areas that are considered to be in the outskirts of the city, where the city is expected to expand in the future. The floor land lease price in the Expansion Zone ranges from Birr 355 to Birr 191 per m² (see Table 5.2).

Table 5.2

NEW LAND LEASE FLOOR PRICE FOR PLOTS IN ADDIS ABABA

Zone	Level	Floor Price/m²
Central Market District	1 st	1686
	2 nd	1535
	3 rd	1323
	4 th	1085
	5 th	894
Transitional zone	1 st	1035
	2 nd	935
	3 rd	809
	4 th	685
	5 th	555
Expansion zone	1 st	355
	2 nd	299
	3 rd	217
	4 th	191

Accordingly, in order to estimate the land lease cost of the project profiles it is assumed that all new manufacturing projects will be located in industrial zones located in expansion zones. Therefore, for the profile a land lease rate of Birr 266 per m² which is equivalent to the average floor price of plots located in expansion zone is adopted.

On the other hand, some of the investment incentives arranged by the Addis Ababa City Administration on lease payment for industrial projects are granting longer grace period and extending the lease payment period. The criterions are creation of job opportunity, foreign exchange saving, investment capital and land utilization tendency etc. Accordingly, Table 5.3 shows incentives for lease payment.

Table 5.3

INCENTIVES FOR LEASE PAYMENT OF INDUSTRIAL PROJECTS

Scored Point	Grace Period	Payment Completion Period	Down Payment
Above 75%	5 Years	30 Years	10%
From 50 - 75%	5 Years	28 Years	10%
From 25 - 49%	4 Years	25 Years	10%

For the purpose of this project profile, the average i.e. five years grace period, 28 years payment completion period and 10% down payment is used. The land lease period for industry is 60 years.

Accordingly, the total land lease cost at a rate of Birr 266 per m² is estimated at Birr 212,800 of which 10% or Birr 21,280 will be paid in advance. The remaining Birr 191,520 will be paid in equal installments with in 28 years i.e. Birr 6,840 annually.

VI. HUMANRESOURCE AND TRAINING REQUIREMENTS

A. HUMANRESOURCE REQUIREMENT

The plant will create job opportunities for 36 workers. Annual cost of labor is Birr 786,240. The list of direct and indirect labor requirement and their monthly and annual cost is shown in Table 6.1.

Table 6.1
HUMAN RESOURCE REQUIREMENT AND COST

No.	Description	Reqd. No.	Monthly Salary (Birr)	Annual salary (`000 Birr)
1	Plant manager	1	6,000.00	72.0
2	Secretary	1	1,500.00	18.0
3	Administration and finance	1	3,500.00	42.0
4	Accountant	1	2,000.00	24.0
5	Mechanic	1	2,200.00	26.4
6	Electrician	1	2,200.00	26.4
7	operators	15	1,400.00	252.0
8	production foreman	1	3,000.00	36.0
9	Clerk	1	800.00	9.6
10	Cashier	1	1,000.00	12.0
11	Assistant operator	5	700.00	42.0
12	Quality supervisor	2	1,600.00	38.4
13	store keeper	1	1,400.00	16.8
14	time keeper	1	1,200.00	14.4
15	Guards	3	700.00	25.2
Total		36	29,200.00	655.2
16	Employment benefits and allowances 20%		5,840.00	131.0
Total Annual Labor Cost (Direct +Indirect)				786.24

B. TRAINING REQUIREMENT

Machinery operators will be trained during machinery commissioning and erection. So the training will be conducted on job base arrangement focused on the chemical process parameters and specifications. Cost of training is included in the cost of machinery.

VII. FINANCIAL ANALYSIS

The financial analysis of the blue print paper project is based on the data presented in the previous chapters and the following assumptions:-

Construction period	1 year
Source of finance	30 % equity & 70 loans
Tax holidays	3 years

Bank interest	10%
Discount cash flow	10%
Accounts receivable	30 days
Raw material imported	120 days
Work in progress	1 day
Finished products	30 days
Cash in hand	5 days
Accounts payable	30 days
Repair and maintenance	5% of machinery cost

A. TOTAL INITIAL INVESTMENT COST

The total investment cost of the project including working capital is estimated at Birr 13.25 million (see Table 7.1). From the total investment cost ,the highest share (Birr 9.04 million or 68.21%) is accounted by initial working capital followed by fixed investment cost (2.97 million or 22.43%) and pre operation cost (Birr 1.24 million or 9.36%). From the total investment cost, Birr 667.00 thousand or 5.03% is required in foreign currency.

Table 7.1**INITIAL INVESTMENT COST ('000 Birr)**

Sr. No	Cost Items	Local Cost	Foreign Cost	Total Cost	% Share
1	Fixed investment				
1.1	Land Lease	21.28		21.28	0.16
1.2	Building and civil work	1,500.00		1,500.00	11.32
1.3	Machinery and equipment	133.40	667	800.40	6.04
1.4	Vehicles	450.00		450.00	3.40
1.5	Office furniture and equipment	200.00		200.00	1.51
	Sub total	2,304.68	667.00	2,971.68	22.43
2	Pre operating cost *				
2.1	Pre operating cost	374.01		374.01	2.82
2.2	Interest during construction	866.90		866.90	6.54
	Sub total	1,240.91		1,240.91	9.36
3	Working capital **	9,038.63		9,038.63	68.21
	Grand Total	12,584.22	667.00	13,251.22	100

* *N.B Pre operating cost include project implementation cost such as installation, startup, commissioning, project engineering, project management etc and capitalized interest during construction.*

** *The total working capital required at full capacity operation is Birr 12.93 million. However, only the initial working capital of Birr 9.03 million during the first year of production is assumed to be funded through external sources. During the remaining years the working capital requirement will be financed by funds to be generated internally (for detail working capital requirement see Appendix 7.A.1).*

B. PRODUCTION COST

The annual production cost at full operation capacity is estimated at Birr 41.32 million (see Table 7.2). The cost of raw material account for 92.79% of the production cost. The other major components of the production cost are financial cost, depreciation, cost of marketing and distribution, and direct labor which account for 1.73%, 0.98%, 1.21% and 1.59%, respectively. The remaining 1.70% is the share of repair and maintenance, utility, labor overhead and administration cost. For detail production cost see Appendix 7.A.2.

Table 7.2**ANNUAL PRODUCTION COST AT FULL CAPACITY (YEAR THREE)**

Items	Cost (000 Birr)	%
Raw Material and Inputs	38,344	92.79
Utilities	300	0.73
Maintenance and repair	24	0.06
Labor direct	655	1.59
Labor overheads	131	0.32
Administration Costs	250	0.60
Land lease cost	0	0.00
Cost of marketing and distribution	500	1.21
Total Operating Costs	40,204	97.29
Depreciation	405	0.98
Cost of Finance	715	1.73
Total Production Cost	41,324	100.00

C. FINANCIAL EVALUATION**1. Profitability**

Based on the projected profit and loss statement, the project will generate a profit throughout its operation life. Annual net profit after tax will grow from Birr 2.82 million to Birr 3.55 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 44.49 million. For profit and loss statement and cash flow projection see Appendix 7.A.3 and 7.A.4, respectively.

2. Ratios

In financial analysis, financial ratios and efficiency ratios are used as an index or yardstick for evaluating the financial position of a firm. It is also an indicator for the strength and weakness of the firm or a project. Using the year-end balance sheet figures and other relevant data, the most

important ratios such as return on sales which is computed by dividing net income by revenue, return on assets (operating income divided by assets), return on equity (net profit divided by equity) and return on total investment (net profit plus interest divided by total investment) has been carried out over the period of the project life and all the results are found to be satisfactory.

3. Break-even Analysis

The break-even analysis establishes a relationship between operation costs and revenues. It indicates the level at which costs and revenue are in equilibrium. To this end, the break-even point for capacity utilization and sales value estimated by using income statement projection are computed as followed.

$$\text{Break -Even Sales Value} = \frac{\text{Fixed Cost} + \text{Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 19,051,200$$

$$\text{Break- Even Capacity utilization} = \frac{\text{Break -even Sales Value}}{\text{Sales revenue}} \times 100 = 25\%$$

4. Pay-back Period

The pay -back period, also called pay-off period is defined as the period required for recovering the original investment outlay through the accumulated net cash flows earned by the project. Accordingly, based on the projected cash flow it is estimated that the project's initial investment will be fully recovered within 2 years.

5. Internal Rate of Return

The internal rate of return (IRR) is the annualized effective compounded return rate that can be earned on the invested capital, i.e., the yield on the investment. Put another way, the internal rate of return for an investment is the discount rate that makes the net present value of the investment's income stream total to zero. It is an indicator of the efficiency or quality of an investment. A project is a good investment proposition if its IRR is greater than the rate of return that could be earned by alternate investments or putting the money in a bank account.

Accordingly, the IRR of this project is computed to be 32.53% indicating the viability of the project.

6. Net Present Value

Net present value (NPV) is defined as the total present (discounted) value of a time series of cash flows. NPV aggregates cash flows that occur during different periods of time during the life of a project in to a common measuring unit i.e. present value. It is a standard method for using the time value of money to appraise long-term projects. NPV is an indicator of how much value an investment or project adds to the capital invested. In principle, a project is accepted if the NPV is non-negative.

Accordingly, the net present value of the project at 10% discount rate is found to be Birr 21.00 million which is acceptable. For detail discounted cash flow see Appendix 7.A.5.

D. ECONOMIC AND SOCIAL BENEFITS

The project can create employment for 36 persons. The project will generate Birr 9.70 million in terms of tax revenue. The establishment of such factory will have a foreign exchange saving effect to the country by substituting the current imports. The project will also create forward linkage with the professional services sub sector and also generates other income for the Government.

Appendix 7.A

FINANCIAL ANALYSES SUPPORTING TABLES

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Appendix 7.A.2**PRODUCTION COST (in 000 Birr)**

Item	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Raw Material and Inputs	26,841	30,675	34,510	38,344	38,344	38,344	38,344	38,344	38,344	38,344
Utilities	210	240	270	300	300	300	300	300	300	300
Maintenance and repair	17	19	22	24	24	24	24	24	24	24
Labour direct	459	524	590	655	655	655	655	655	655	655
Labour overheads	92	105	118	131	131	131	131	131	131	131
Administration Costs	175	200	225	250	250	250	250	250	250	250
Land lease cost	0	0	0	0	17	7	7	7	7	7
Cost of marketing and distribution	500	500	500	500	500	500	500	500	500	500
Total Operating Costs	28,293	32,263	36,234	40,204	40,211	40,211	40,211	40,211	40,211	40,211
Depreciation	405	405	405	405	405	80	80	80	80	80
Cost of Finance	0	954	834	715	596	477	358	238	119	0
Total Production Cost	28,698	33,622	37,473	41,324	41,212	40,768	40,648	40,529	40,410	40,291

Appendix 7.A.3
INCOME STATEMENT (in 000 Birr)

Item	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Sales revenue	31,752	40,824	45,360	45,360	45,360	45,360	45,360	45,360	45,360	45,360
Less variable costs	27,793	31,763	35,734	39,704	39,704	39,704	39,704	39,704	39,704	39,704
VARIABLE MARGIN	3,959	9,061	9,626	5,656	5,656	5,656	5,656	5,656	5,656	5,656
in % of sales revenue	12.47	22.19	21.22	12.47	12.47	12.47	12.47	12.47	12.47	12.47
Less fixed costs	905	905	905	905	912	587	587	587	587	587
OPERATIONAL MARGIN	3,054	8,156	8,722	4,751	4,744	5,069	5,069	5,069	5,069	5,069
in % of sales revenue	9.62	19.98	19.23	10.47	10.46	11.18	11.18	11.18	11.18	11.18
Financial costs		954	834	715	596	477	358	238	119	0
GROSS PROFIT	3,054	7,202	7,887	4,036	4,148	4,592	4,712	4,831	4,950	5,069
in % of sales revenue	9.62	17.64	17.39	8.90	9.15	10.12	10.39	10.65	10.91	11.18
Income (corporate) tax	0	0	0	1,211	1,244	1,378	1,413	1,449	1,485	1,521
NET PROFIT	3,054	7,202	7,887	2,825	2,904	3,215	3,298	3,382	3,465	3,548
in % of sales revenue	9.62	17.64	17.39	6.23	6.40	7.09	7.27	7.45	7.64	7.82

Appendix 7.A.4**CASH FLOW FOR FINANCIAL MANAGEMENT (in 000 Birr)**

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Scrap
TOTAL CASH INFLOW	3,346	41,697	40,830	45,366	45,360	45,360	45,360	45,360	45,360	45,360	45,360	14,683
Inflow funds	3,346	9,945	6	6	0	0	0	0	0	0	0	0
Inflow operation	0	31,752	40,824	45,360	45,360	45,360	45,360	45,360	45,360	45,360	45,360	0
Other income	0	0	0	0	0	0	0	0	0	0	0	14,683
TOTAL CASH OUTFLOW	3,346	38,238	35,700	39,551	44,613	43,244	43,257	43,174	43,090	43,007	41,732	0
Increase in fixed assets	3,346	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	9,078	1,291	1,291	1,291	1	0	0	0	0	0	0
Operating costs	0	27,793	31,763	35,734	39,704	39,711	39,711	39,711	39,711	39,711	39,711	0
Marketing and Distribution cost	0	500	500	500	500	500	500	500	500	500	500	0
Income tax	0	0	0	0	1,211	1,244	1,378	1,413	1,449	1,485	1,521	0
Financial costs	0	867	954	834	715	596	477	358	238	119	0	0
Loan repayment	0	0	1,192	1,192	1,192	1,192	1,192	1,192	1,192	1,192	0	0
SURPLUS (DEFICIT)	0	3,459	5,130	5,815	747	2,116	2,103	2,186	2,270	2,353	3,628	14,683
CUMULATIVE CASH BALANCE	0	3,459	8,589	14,404	15,151	17,267	19,370	21,556	23,825	26,178	29,807	44,490

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Appendix 7.A.5**DISCOUNTED CASH FLOW (in 000 Birr)**

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Scrap
TOTAL CASH INFLOW	0	31,752	40,824	45,360	45,360	45,360	45,360	45,360	45,360	45,360	45,360	14,683
Inflow operation	0	31,752	40,824	45,360	45,360	45,360	45,360	45,360	45,360	45,360	45,360	0
Other income	0	0	0	0	0	0	0	0	0	0	0	14,683
TOTAL CASH OUTFLOW	12,384	29,578	33,548	37,519	41,415	41,455	41,589	41,624	41,660	41,696	41,732	0
Increase in fixed assets	3,346	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	9,039	1,285	1,285	1,285	1	0	0	0	0	0	0	0
Operating costs	0	27,793	31,763	35,734	39,704	39,711	39,711	39,711	39,711	39,711	39,711	0
Marketing and Distribution cost	0	500	500	500	500	500	500	500	500	500	500	0
Income (corporate) tax		0	0	0	1,211	1,244	1,378	1,413	1,449	1,485	1,521	0
NET CASH FLOW	-12,384	2,174	7,276	7,841	3,945	3,905	3,771	3,736	3,700	3,664	3,628	14,683
CUMULATIVE NET CASH FLOW	-12,384	10,210	-2,935	4,906	8,851	12,755	16,527	20,263	23,963	27,627	31,255	45,938
Net present value	-12,384	1,976	6,013	5,891	2,694	2,424	2,129	1,917	1,726	1,554	1,399	5,661
Cumulative net present value	-12,384	10,408	-4,395	1,496	4,190	6,615	8,744	10,661	12,387	13,941	15,339	21,000

NET PRESENT VALUE 21,000
INTERNAL RATE OF RETURN 32.53%
NORMAL PAYBACK 2 years