

**113. PROFILE ON THE PRODUCTION OF BAMBOO
FURNITURE**

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I. SUMMARY

This profile envisages the establishment of a plant for the production of bamboo furniture with a capacity of 3,800 sets (3,800 tables and 15,200 chairs) per annum. Bamboo furniture is furniture made from bamboo and it could be used in individual homes, hotels and recreational areas.

The demand for wood furniture is met through import and local production. The present (2012) unsatisfied demand for wood (which will be replaced by bamboo furniture) is estimated at 76,444 pieces. The demand for bamboo furniture is projected to reach 123,114 pieces and 198,276 pieces by the year 2017 and 2022, respectively.

The principal raw materials required is bamboo, which is available locally.

The total investment cost of the project including working capital is estimated at Birr 4.51 million. From the total investment cost the highest share (Birr 3.54 million or 78.53%) is accounted by fixed investment cost followed by pre operation cost (Birr 664.00 thousand or 14.71%) and initial working capital (Birr 305.42 thousand or 6.77%). From the total investment cost Birr 322.68 thousand or 7.15% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 32.63% and a net present value (NPV) of Birr 6.15 million discounted at 10%.

The project can create employment for 15 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 backward linkage with the forestry sub sector and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

Bamboo furniture is furniture made from bamboo. At present, there are few artisans engaged in bamboo articles production. This includes tables, chairs and various house hold items. Bamboo furniture could be used in individual homes, hotels and recreational areas.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

Furniture is movable articles commonly made from wood, metal, stone and plastics. Wooden furniture being the most preferable, now-a-days since wood based furniture is becoming expensive, bamboo furniture is emerging as the best substitute for wooden furniture. Hence, the demand for bamboo furniture is estimated based on the demand for wood furniture.

The local demand for wood furniture is met through import and local production. However, there is no available data that shows local production of wood furniture. Therefore, for estimating the demand for wood furniture the unsatisfied demand i.e. the demand met through import is considered. Accordingly, Table 3.1 shows import of wood furniture for the period 2002-2011.

Table 3.1
IMPORT OF WOOD FURNITURE (PIECES)

Year	Import
2002	141,631
2003	81,916
2004	565,727
2005	163,195
2006	209,690
2007	329,297
2008	376,599
2009	206,110
2010	383,879
2011	327,338

Source: - Ethiopian Revenue and Customs Authority

As can be seen from Table 3.1, import of wood furniture for the period 2002-2011 ranges from the lowest 81,916 pieces (year 2003) to the highest 383,879 pieces (year 2010) with annual average of about 278,538 pieces. Though import of wood furniture fluctuates from year to year, a general growth trend can be observed. For example average import during the first five years of

the data set (2002 – 2006) was 232,432 pieces tones which has increased to 324,645 pieces during the next five years (2007-2011) average.

Accordingly, due to the nature of the import data the recent four years (2008-2011) average level of import is assumed to reflect the current unsatisfied demand. Accordingly, current unsatisfied demand for wood furniture is estimated at 305,776 pieces and conservatively assuming that 25% of the current unsatisfied demand for wood furniture will be replaced by bamboo furniture the current (2012) is estimated at 76,444 pieces.

2. Projected Demand

The demand for bamboo furniture is even though is directly related with new housing units, the replacement of existing furniture with bamboo furniture will also be major market segment. Generally, household spending on furniture and fixture increases with the per capita growth rate. Thus, it is appropriate to forecast the demand for bamboo furniture along with GDP growth rate.

According to the government's "Growth and Transformation Plan" during the period 2010 – 2015 the GDP of the country is expected to grow at a minimum average annual growth rate of 11.2%.

Accordingly, in order to be conservative a growth rate of 10% which is slightly lower than the expected growth rate of the country's GDP during the GTP period (2011 – 2015) is used.

Based on the above assumption and using the estimated present demand as a base the projected demand for bamboo furniture is shown in Table 3.2.

Table 3.2
PROJECTED DEMAND FOR BAMBOO FURNITURE (PIECES)

Year	Projected Demand
2013	84,088
2014	92,497
2015	101,747
2016	111,922
2017	123,114
2018	135,425
2019	148,968
2020	163,864
2021	180,251
2022	198,276
2023	218,103
2024	239,914
2025	263,905

3. Pricing and Distribution

After considering the current retail price of various types of furniture, a factory-gate price of Birr 1,000 per set (one table and four chairs) is recommended for the envisaged plant. The product can be distributed through establishment of own outlets at selected urban centers.

B. PLANT CAPACITY AND PRODUCTION PROGRAMME

1. Plant Capacity

The envisaged plant, at the initial stage, can be made to produce tables and chairs. At later stages, the plant can diversify its production to baskets, and bamboo-based doors and windows. Based on the market study, the plant is designed to produce 3,800 sets of bamboo furniture's (3,800 tables and 15,200 chairs) operating 300 days per year and 8 hours a day in a single shift. Sundays and National holidays are taken into consideration in setting the number of working days.

2. Production Programme

The plant will start production at 75% of its rated capacity. Then, it will build up production to 85% and 100% in the successive years. The gradual capacity build-up is suggested to develop substantial market outlets for the product and enable the operators to get adequate time to develop the required skills and experience.

IV. MATERIALS AND INPUTS

A. RAW AND AUXILIARY MATERIALS

The major raw material is bamboo. Other materials include varnish and black oil. The total annual expenditure for raw material and auxiliary materials required by the plant is estimated at Birr 521,500. Details are shown in Table 4.1.

Table 4.1

ANNUAL RAW AND AUXILIARY MATERIALS REQUIREMENT AND COST

Sr. No.	Description	Quantity	Unit	Unit Cost (Birr)	Cost (`000 Birr)		
					LC	FC	Total (Birr)
1	Raw bamboo	250,000	pcs	4	1,000	-	1,000
2	Varnish & Black Oil	300	Gallons	450	135	-	135
3	Others			-	25	-	25
Total Raw material Annual cost						-	1,160

B. UTILITIES

Utilities required by the envisaged plant consist of electricity and water. The annual cost of utilities is estimated at Birr 13,450.00. From this, electric consumption (50,000 kWh) accounts for Birr 32,500 and water consumption (1500m³) accounts for Birr 6,000. For details see Table 4.1

Table 4.1**ANNUAL UTILITIES REQUIREMENT AND COST**

Sr. No.	Description	Annual Consumption	unit	Unit Cost (Birr)	Total Cost ('000 Birr)
1	Electricity	50,000	kwh	0.58	29.00
2	Water	950	m ³	10.00	9.50
Total Annual cost					38.50

V. TECHNOLOGY AND ENGINEERING**A. TECHNOLOGY****1. Production Process**

The major operation involved in the production of bamboo furniture (tables & chairs) are raw bamboo cooking, slitting, forming (setting the framework) body preparation and finishing. Different designs can be incorporated into the product.

First raw bamboo is cooked and dried. Then, it is split and cut into required thickness and size by tools prepared for this purpose. The framework required for the specific product is, then, prepared. Bamboo splits are, then, interwoven according to the design and required strength. Varnishes can be applied on the product to produce fine and attractive finish.

2. Environmental impact

The envisaged plant production is environmental friendly with no additional investment for environmental protection.

B. ENGINEERING

1. Machinery and Equipment

Machinery and equipment required by the plant are a range of wood working tools together with benches. Hand saws, knives, vises, hand drills, etc. are some of the useful appliance required by the plant. The complete list of machinery & equipment together with the cost, which is required in local currency, is estimated to be birr 373,500.00, as given in Table 5.1.

Table 5.1

LIST OF MACHINERY AND EQUIPMENT AND COST

NO.	Description	Qty	Unit	Unit Cost (Birr)	Cost (''000) Birr		
					LC	FC	Total
1	Knives (pcs)	19	pcs	80.00	1.52	-	1.52
2	Hacksaw (with blades)	11	psc	160.00	1.76	-	1.76
3	Drilling machine	3	set	6,000.00	18.00	-	18.00
4	Grinding machine	6	set	4,000.00	24.00	-	24.00
5	LPG torch (with gas cylinders)	7	set	1,000.00	7.00	-	7.00
6	Vise (with benches)	8	pcs	1,600.00	12.80	-	12.80
7	Files	20	pcs	80.00	1.60	-	1.60
8	Wood lathe	1	pcs	180,000.00	180.00	-	180.00
9	Power saw	1	pcs	60,000.00	60.00	-	60.00
10	Other items	-	set	-	16.00	-	16.00
Total Fob Price							322.68
11	Spare parts (5%)						16.13
12	CIF (15%)						50.82
Total machinery and equipment cost							373.50

2. Building and Civil Works

The plant requires a total of 800 m² area of land out of which 400 m² is built-up area which includes Processing area, raw material stock area, offices etc. Assuming construction rate of Birr 5,000 per m² the total investment cost for, building and civil works is estimated at Birr 2 million.

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 5000 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 criteria 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. HUMAN RESOURCE AND TRAINING REQUIREMENT

A. HUMAN RESOURCE REQUIREMENT

Human resource required by the plant is 15 persons. Annual labor cost is estimated at Birr 273,600. The detailed list of labor force along with monthly and annual labor cost is presented in Table 6.1.

Table 6.1
HUMAN RESOURCE REQUIREMENT AND LABOUR COST

Sr. No.	Description	Qty	Monthly Salary (Birr)	Annual salary (`000 Birr)
1	Plant manager	1	3,000.00	36.0
2	Secretary	1	1,000.00	12.0
3	Administration and finance	1	2,000.00	24.0
4	Accountant	1	1,200.00	14.4
5	Mechanic	1	1,000.00	12.0
6	Laborers	5	800.00	48.0
7	Clerk	1	800.00	9.6
8	Cashier	1	800.00	9.6
9	Quality supervisor	1	1,500.00	18.0
10	store keeper	1	800.00	9.6
11	time keeper	1	800.00	9.6
12	Guards	3	700.00	25.2
Total		18	14,400.00	228.0
13	Employment benefits and allowances 20%		2,880.00	45.6
Total Annual Labor cost (Direct +Indirect)				273.6

B. TRAINING REQUIREMENT

The operators are required to be trained in institution like Development Agency for Handcrafts and Small Industries (DAHSI) in Addis Ababa. Such training is estimated at Birr 20,000.

VII. FINANCIAL ANALYSIS

The financial analysis of the bamboo furniture 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 loan
Tax holidays	3 years
Bank interest	10%
Discount cash flow	10%
Accounts receivable	30 days
Raw material local	30 days
Work in progress	1 days
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 4.51 million (See Table 7.1). From the total investment cost the highest share (Birr 3.54 million or 78.53%) is accounted by fixed investment cost followed by pre operation cost (Birr 664.00 thousand or 14.71%) and initial working capital (Birr 305.42 thousand or 6.77%). From the total investment cost Birr 322.68 thousand or 7.15% 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	0.47
1.2	Building and civil work	2,000.00		2,000.00	44.30
1.3	Machinery and equipment	50.82	322.68	373.50	8.27
1.4	Vehicles	900.00		900.00	19.94
1.5	Office furniture and equipment	250.00		250.00	5.54
	Sub total	3,222.10	322.68	3,544.78	78.53
2	Pre operating cost *				
2.1	Pre operating cost	368.68		368.68	8.17
2.2	Interest during construction	295.32		295.32	6.54
	Sub total	664.00		664.00	14.71
3	Working capital **	305.42		305.42	6.77
	Grand Total	4,191.52	322.68	4,514.20	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 468.99 thousand. However, only the initial working capital of Birr 305.36 thousand 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 2.53 million (see Table 7.2). The cost of raw material account for 45.92% of the production cost. The other major components of the production cost are depreciation, financial cost, labour , and cost of marketing and distribution which account for 17.16%, 9.65% , 9.03%, and 7.92% respectively. The remaining 10.32% is the share of utility, repair and maintenance, labour 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	1,160	45.92
Utilities	39	1.54
Maintenance and repair	26	1.03
Labour direct	228	9.03
Labour overheads	46	1.82
Administration Costs	150	5.94
Land lease cost	0	0.00
Cost of marketing and distribution	200	7.92
Total Operating Costs	1,849	73.20
Depreciation	433	17.16
Cost of Finance	244	9.65
Total Production Cost	2,526	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 892 thousand to Birr 1.29 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 12.64 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.

$$\text{Break Even Sales Value} = \frac{\text{Fixed Cost} + \text{Financial Cost}}{\text{Variable Margin ratio (\%)}} = 1,596,000 \text{ Birr}$$

$$\text{Break Even Capacity utilization} = \frac{\text{Break even Sales Value}}{\text{Sales revenue}} \times 100 = 27.35\%$$

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 3 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 32.63% 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 principal 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 6.15 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 15 persons. The project will generate Birr 3.41 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 backward linkage with the forestry sub sector and also generate other income for the Government.

Appendix 7.A

FINANCIAL ANALYSES SUPPORTING TABLES

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	812	928	1,044	1,160	1,160	1,160	1,160	1,160	1,160	1,160
Utilities	27	31	35	39	39	39	39	39	39	39
Maintenance and repair	18	21	23	26	26	26	26	26	26	26
Labour direct	160	182	205	228	228	228	228	228	228	228
Labour overheads	32	37	41	46	46	46	46	46	46	46
Administration Costs	105	120	135	150	150	150	150	150	150	150
Land lease cost	0	0	0	0	7	7	7	7	7	7
Cost of marketing and distribution	200	200	200	200	200	200	200	200	200	200
Total Operating Costs	1,354	1,519	1,684	1,849	1,856	1,856	1,856	1,856	1,856	1,856
Depreciation	433	433	433	433	433	105	105	105	105	105
Cost of Finance	0	325	284	244	203	162	122	81	41	0
Total Production Cost	1,788	2,277	2,402	2,526	2,492	2,123	2,083	2,042	2,001	1,961

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	2,660	3,420	3,800	3,800	3,800	3,800	3,800	3,800	3,800	3,800
Less variable costs	1,154	1,319	1,484	1,649	1,649	1,649	1,649	1,649	1,649	1,649
VARIABLE MARGIN	1,506	2,101	2,316	2,151	2,151	2,151	2,151	2,151	2,151	2,151
in % of sales revenue	56.61	61.43	60.94	56.61	56.61	56.61	56.61	56.61	56.61	56.61
Less fixed costs	633	633	633	633	640	312	312	312	312	312
OPERATIONAL MARGIN	872	1,467	1,682	1,518	1,511	1,839	1,839	1,839	1,839	1,839
in % of sales revenue	32.79	42.91	44.28	39.94	39.76	48.40	48.40	48.40	48.40	48.40
Financial costs		325	284	244	203	162	122	81	41	0
GROSS PROFIT	872	1,143	1,398	1,274	1,308	1,677	1,717	1,758	1,799	1,839
in % of sales revenue	32.79	33.41	36.80	33.52	34.41	44.12	45.19	46.26	47.33	48.40
Income (corporate) tax	0	0	0	382	392	503	515	527	540	552
NET PROFIT	872	1,143	1,398	892	915	1,174	1,202	1,231	1,259	1,287
in % of sales revenue	32.79	33.41	36.80	23.47	24.09	30.89	31.64	32.38	33.13	33.88

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	3,913	3,276	3,422	3,802	3,800	3,800	3,800	3,800	3,800	3,800	3,800	1,946
Inflow funds	3,913	616	2	2	0	0	0	0	0	0	0	0
Inflow operation	0	2,660	3,420	3,800	3,800	3,800	3,800	3,800	3,800	3,800	3,800	0
Other income	0	0	0	0	0	0	0	0	0	0	0	1,946
TOTAL CASH OUTFLOW	3,913	1,970	2,293	2,418	2,924	2,858	2,927	2,899	2,871	2,842	2,408	0
Increase in fixed assets	3,913	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	320	43	43	43	1	0	0	0	0	0	0
Operating costs	0	1,154	1,319	1,484	1,649	1,656	1,656	1,656	1,656	1,656	1,656	0
Marketing and Distribution cost	0	200	200	200	200	200	200	200	200	200	200	0
Income tax	0	0	0	0	382	392	503	515	527	540	552	0
Financial costs	0	295	325	284	244	203	162	122	81	41	0	0
Loan repayment	0	0	406	406	406	406	406	406	406	406	0	0
SURPLUS (DEFICIT)	0	1,306	1,129	1,384	876	942	873	901	929	958	1,392	1,946
CUMULATIVE CASH BALANCE	0	1,306	2,434	3,819	4,694	5,637	6,509	7,410	8,340	9,298	10,690	12,636

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	2,660	3,420	3,800	3,800	3,800	3,800	3,800	3,800	3,800	3,800	1,946
Inflow operation	0	2,660	3,420	3,800	3,800	3,800	3,800	3,800	3,800	3,800	3,800	0
Other income	0	0	0	0	0	0	0	0	0	0	0	1,946
TOTAL CASH OUTFLOW	4,219	1,396	1,560	1,725	2,232	2,248	2,359	2,371	2,383	2,395	2,408	0
Increase in fixed assets	3,913	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	305	41	41	41	1	0	0	0	0	0	0	0
Operating costs	0	1,154	1,319	1,484	1,649	1,656	1,656	1,656	1,656	1,656	1,656	0
Marketing and Distribution cost	0	200	200	200	200	200	200	200	200	200	200	0
Income (corporate) tax		0	0	0	382	392	503	515	527	540	552	0
NET CASH FLOW	-4,219	1,264	1,860	2,075	1,568	1,552	1,441	1,429	1,417	1,405	1,392	1,946
CUMULATIVE NET CASH FLOW	-4,219	-2,954	-1,095	980	2,548	4,100	5,541	6,970	8,387	9,791	11,184	13,130
Net present value	-4,219	1,150	1,537	1,559	1,071	964	813	733	661	596	537	750
Cumulative net present value	-4,219	-3,069	-1,533	26	1,097	2,061	2,874	3,608	4,269	4,864	5,401	6,151

NET PRESENT VALUE 6,151
INTERNAL RATE OF RETURN 32.63%
NORMAL PAYBACK 3 years

