

PROFILE ON THE PRODUCTION OF TOWELS

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I. SUMMARY

This profile envisages the establishment of a plant for the production of towels with a capacity of 30 tons per annum. Towels are woven pieces of fabric either cotton or cotton-polyester that are used to absorb moisture on the body after bathing.

The demand for towels is met through import and domestic production. The present (2012) unsatisfied demand for towels is estimated at 15.75 tons. The unsatisfied demand for towels is projected to reach 25.37 tons and 40.85 tons by the year 2017 and 2022, respectively.

The principal raw materials required are cotton or cotton and polyester, softeners (starch, urea, etc), bleaching agents, and packing material. The raw materials are available locally except bleaching agents which have to be imported.

The total investment cost of the project including working capital is estimated at Birr 11.85 million. From the total investment cost, the highest share (Birr 10.05 million or 84.83%) is accounted by fixed investment cost followed by pre operation cost (1.27 million or 10.74%) and initial working capital (Birr 525.74 thousand or 4.44%). From the total investment cost, Birr 3.67 million or 30.97% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 23.08% and a net present value (NPV) of Birr 7.62 million discounted at 10%.

The project can create employment for 54 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 yarn factories, chemical and packaging sub sectors and also generates other income for the Government.

II. PRODUCT DESCRIPTION AND APPLICATION

Towels are woven pieces of fabric either cotton or cotton-polyester that are used to absorb moisture on the body after bathing. Towels are often sold in a set with face towels and wash cloths and are always the largest of the three towels. Towels are generally woven with a loop or pile that is soft and absorbent and is thus used to wick the water away from the body. Special looms called dobby looms are used to make this cotton pile.

Towels are generally of a single color but may be decorated with machine-sewn embroidery, woven in fancy jacquard patterns (pre-determined computer program driven designs) or even printed in stripes. Since towels are exposed to much water and are washed on hot-water wash settings more frequently than other textiles, printed towels may not retain their pattern very long. Most towels have a two selvage edges or finished woven edges along the sides and are hemmed (cut and sewn down) at the top and bottom. Some toweling manufacturers produce the yarn used for the toweling, weave the towels, dye them, cut and sew hems, and ready them for distribution. Others purchase the yarn already spun from other wholesalers and only weave the toweling.

The towel can be classified into three groups, namely the figured towel which has woven figures, the dobby towel which has small geometrical figures, and the plain towel which does not have figures. All towels are woven from three kinds of yarns, namely ground warp, loop warp, and weft. There is another way of classifying towels. One is bleached; dyed, printed, etc. on the plain towel woven of grey cotton yarn and the other is colored woven of dyed or bleached yarn.

The quality of the towel is largely dependent upon the density of loops, i.e. the denser, the better. Loops can be generated either every three warps or every four warps. Hence, generally speaking, towels of good quality have loops on every three warps and are consequently of high loop density.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

The demand for towels is essentially met through import although it is also produced locally. To get an overview on the extent of the unsatisfied demand on towels, data on the import of the product obtained from Ethiopian Revenues & Customs Authority is presented in Table 3.1. During this period, imports of towels varied from 3.3 ton in 2003 to 38.12 tons in 2001. Imports of the product averaged 14.32 during the period.

Table 3.1
IMPORTS OF TOWELS (2000 – 2011)

Years	Quantity (tons)	Value (‘000 Birr)
2000	23.60	331.9
2001	38.12	478.6
2002	16.00	191.8
2003	3.30	62.2
2004	9.75	190.5
2005	4.72	167.4
2006	16.20	268.3
2007	25.10	557.8
2008	11.60	247.4
2009	12.90	207.9
2010	5.71	325.4
2011	4.80	362.4
Average	14.32	282.63

Source: - Ethiopian Revenues & Customs Authority.

As could be seen from Table 3.1, import of towels in the past twelve years has been highly erratic. During the initial years of the data set i.e. 2000--2002, the yearly average level of import was about 26 tons. In the following three years i.e. 2003--2004 the annual average level of import declined sharply to a level of about 6 tons. After such a huge decline it again started to increase during the following four years of 2006--2009. During this period the annual average level of import was 16.5 tons, which is higher by 2.7 times compared to the previous three years average. However, the increase did not stay long and again plummeted to a yearly average of only 5 tons during the last and recent two years i.e. 2010 and 2011. The high fluctuations observed in the data set could be due to stock carry over from periods where import was high to these periods import was low.

In the absence of a trend in the data set the present unsatisfied demand for towels is determined by taking the following assumptions. First, the 12 years average level of import of the product during the period under reference is assumed to reflect the demand for the year 2011. Then, a modest estimate of average annual growth rate of 10% is applied to arrive at the current (year 2012) unsatisfied demand for the product. Thus, the current unsatisfied demand for the product is estimated at 15.75 tons.

2. Demand Projection

Demand for towels is mainly influenced by population growth, urbanization, economic growth (rise in income and hence purchasing power of the population). Given the rapid population and economic growth, and the rate of urbanization in the country a modest estimate of 10% average annual growth rate is considered in projecting the unsatisfied demand for towels. The projected unsatisfied demand for the product is shown in Table 3.2.

Table 3.2

PROJECTED DEMAND UNSATISFIED FOR TOWELS (TONS)

Year	Projected Demand
2013	17.33
2014	19.06
2015	20.96
2016	23.06
2017	25.37
2018	27.90
2019	30.69
2020	33.76
2021	37.14
2022	40.85

3. Pricing and Distribution

On the basis of the customs data for 2011 (the latest data available), the CIF price of towels was Birr 175,500 per ton. Allowing 25% for import duty and other clearing expensed, the factory gate price for the envisaged plant is estimated at Birr 219,375 per ton.

The envisaged plant can use the existing textile and textile products wholesale and retail channel to distribute its product.

B. PLANT CAPACITY AND PRODUCTION PROGRAMM

1. Plant Capacity

According to market study, the demand for towel grows to 17.33 tons and 40.85 tons by the year 2013 and 2020, respectively. It is, therefore, envisaged that a plant with an annual capacity of 30 tons of assorted towels shall be established. The type of towels proposed are bath, wash and face towels. A total of 250 working days per annum and a single shift of eight hours per day is the basis of capacity determination.

2. Production Program

The envisaged plant will start operation in a single shift, 8 hours a day, and 250 days a year. Production can be scheduled to grow to full capacity in three consecutive years, starting at 75% of installed capacity in the first year, and raising the production to 85% in the second year. Full capacity production will then be attained in the third year and then after. Production output can be doubled or tripled by introducing a second or third shift in the daily production programme depending upon the market demand. Table 3.3 below depicts the proposed production program.

Table 3.3
PRODUCTION PROGRAM

Year	1	2	3
Capacity utilization [%]	75	85	100
Production (tons)	22.5	25.5	30

IV. RAW MATERIALS AND INPUTS

A. RAW MATERIALS

Raw materials include cotton or cotton and polyester, depending on the composition of the towel in production. Some towel factories purchase the primary raw material, cotton, in 227 kg bales and spin them with synthetics in order to get the type of yarn they need for production. However, some factories purchase the yarn from a supplier. These yarn spools of cotton-polyester blend yarn are purchased in huge quantities in 3.4 kg spools of yarn. A single spool of yarn unravels to 60,324 m of thread.

Yarn must be coated or sized in order for it to be woven more easily. One such industry coating contains PVA starch, urea, and wax. Bleaches are generally used to whiten a towel before dyeing it (if it is to be dyed). Again, these bleaches vary depending on the manufacturer, but may include as many as 10 ingredients (some of them proprietary) including hydrogen peroxide, a caustic defoamer, or if the towel is to remain white, an optical brightener to make the white look brighter. Synthetic or chemical dyes, of complex composition, which make towels both colorfast and bright, may also be used. The yearly raw material requirement at full capacity utilization is tabulated in Table 4.1.

Table 4.1

RAW MATERIALS REQUIREMENT AND COST AT FULL CAPACITY

Sr. No.	Description	Unit of Measure	Qty	Total cost, ['000 Birr]		
				LC	FC	TC
1	Cotton-polyester blend yarn	tons	32	1,664		1,664
2	Softeners(starch, urea, etc)	tons	6	78		78
3	Bleaching agents	tons	8		232	232
4	Packing material	tons	3	45		45
	Grand Total			1,787	232	2,019

B. UTILITIES

Utilities required by the plant are comprised of electricity and water. Annual cost of utilities is Birr 117,400. Table 4.2 presents annual requirement of utilities and corresponding cost at full production capacity.

Table 4.2

ANNUAL REQUIREMENT OF UTILITIES AND COST

Sr. No.	Description	Unit of Measure	Qty.	Unit Price	Total Cost ('000Birr)
1	Electricity	kWh	30,000	0.58	17.40
2	Water	m ³	10,000	10.00	100.00
	Grand Total		-	-	117.40

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Process Description

The manufacturing process of towel industry involves the following major operation and steps:

Spinning

The processing involves opening, blending, carding (in some cases also combing), drawing, and roving to produce the material for the spinning frame. This is followed by the spinning itself.

Spinning twists fibers of finite length together to form a long, continuous length of thread or yarn.

Warping

Warp is longitudinal threads in a piece of woven material that are tightly stretched or warped on a beam. Latitudinal threads called weft or filler are passed under and over the warp to form the fabric. The large spools of just-spun cotton are ready to be warped or wound on a beam that will be inserted into the loom for weaving. A warping beam is then warped in which threads are anchored and wrapped to a large beam in hundreds of parallel rows. Different towel widths require different numbers of warp threads.

These huge beams, full of wrapped warp threads, are placed into a rack that holds up to 12 beams and sized in preparation for weaving. The threads must be sized or stiffened to make the piece easier to weave. PVA starch, urea, and wax are rolled onto and pressed into the yarn. The threads are then run over drying cans—Teflon-coated cans with steam heat emanating from within. This helps to dry the warp threads quickly. (1,000 warp ends are pulled over nine cans to dry.) These beams, with coated threads, are now sent to the looms.

Weaving

The beams are picked up by a pallet jack or hydraulic lift truck and transported to looms. These looms vary in width but may be as narrow as 85 in (216 cm) or as wide as 153 in (389 cm). (Not surprisingly, the wider the loom, the slower the weaving as it takes longer for weft threads to cross the warp.) The beams are lifted onto the looms mechanically with a warp jack, which can bear the weight and size of the beam.

Towels are woven on dobby looms, meaning each loom has two sets or warp and thus two warp beams—one warp is called the ground warp and forms the body of the towel and the other is called the pile warp and it produces the terry pile or loop. Each set of warp threads is carefully fed through a set of metal eyes and is attached to a harness. (Harnesses are separate, parallel frames that can change in their vertical relationships to one another.) These harnesses

mechanically raise and lower these warp threads so that the weft or filler can be passed between them. The intersection of the warp and weft is woven fabric.

The filler yarn is programmed so that it is loosely laid into the woven fabric. When this loose filler is beaten or pressed into the fabric, the slack is pushed up becoming a little loop.

After being dyed, the towel is hemmed and cut into standardized sizes. Shuttles, which carry the filler threads, are truly shot across these large looms at top-speeds—these towel-making looms may have 18 shuttles fired across the warp from a firing cylinder. One shuttle follows right behind the next. As soon as the one shuttle shoots across the warp threads, the shuttle drops down and is transported back to firing cylinder and is shot across again. A typical towel-weaving machine has 350 shuttle insertions in a single minute—nearly six shuttles fired across each second. Thus, towels are woven very quickly on these large mechanized dobby looms. In one small towel-making factory, 250 dozen bath towels can be made in one loom in a single week—and there are 50 looms in the factory.

Bleaching

Once the toweling is made (it is one long terry cloth roll and has no beginning or end), it is wound on an off-loom take-up reel. It is then transported to bleaching as huge rolls of fabric and put into a water bath with bleaching chemicals such as hydrogen peroxide, caustic defoamers, and other proprietary ingredients. All toweling must be dyed pure white before it is dyed any color. The wet toweling laden with chemicals is then subjected to tremendously high temperatures. The heat makes the chemicals react, bleaching the towel. The roll is then washed at least once and as many as three times in a large washer to get all chemicals out of the toweling. The toweling is dried, and if it is to remain white toweling, it is ready to be cut at the top and bottom, lock-stitched sewn, and have a label attached (all of this is done with one machine).

Dyeing

If it is to be dyed, the large, dried uncut rolls are taken to large vats of chemical dyes, which have proven over time to provide colorfast toweling after extensive residential laundering. After being immersed in the vat, the toweling is removed and pressed between two heavy rollers which

forces the dye down into the toweling. A thorough steaming sets the color. The toweling is again steam-dried, fluffed in the drying process, and then the dyed towels are ready for cutting, hemming, and labeling.

Cutting, folding, and packaging

Final visual inspection of the cut and hemmed towels occurs and they are hand folded and conveyed to packaging, where automatic packaging equipment forms a bag around the towels and UPC labels are attached to the bags. These packaged towels are sent to the stock room, awaiting transport out of the plant.

2. Environmental Impact Assessment

The envisaged plant operation involves the process of dyeing and bleaching and therefore the liquid wastes generated from the process shall be treated using the right treatment unit before disposing waste waters to the environment. The envisaged plant has considered the treatment section and the investment cost is included in the machinery and equipment cost.

B. ENGINEERING

1. Machinery and Equipment

The total cost of machinery and equipment is estimated at Birr 4.9 million of which 3.67 million is required in foreign currency. Machinery and equipment required for the envisaged plant are conventional one. The list of equipments is given in Table 5.1.

Table 5.1
MACHINERY AND EQUIPMENT REQUIREMENT

Sr. No.	Description	Qty
1	Winding (high speed cheese winder)	1
2	Cheese dyeing and bleaching machine	
	High temperature and high pressure cheese dyeing machine	1
	High pressure rapid dyeing machine	1
	Rewinding machine(high speed cone winder)	1
4	Preparation for weaving	
	Sectional warping machine	1
	Rewinding machine	1
	Universal wrap tying machine	1
	Reaching-in machine	1
	Automatic pirn winder	1
5	Weaving	
	Cop change(different size)	5
6	Cloth painting inspecting machine	1
7	Finishing	
	Lock stitch sewing machine	1
	Over lock stitch sewing machine	1
8	Boiler	1
9	Waste water treatment unit	set

2. Land, Building and Civil Works

The total area required for plant site is estimated to be 2,000 m²; of this the built-up area of the factory will be 900 m². Building cost is estimated to be Birr 5,000 per m², and the total building cost will, then, be Birr 4.5 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 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
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 532,000 of which 10% or Birr 53,200 will be paid in advance. The remaining Birr 478,800 will be paid in equal installments with in 28 years i.e. Birr 17,100 annually.

NB: The land issue in the above statement narrates or shows only Addis Ababa's city administration land lease price, policy and regulations.

Accordingly the project profile prepared based on the land lease price of Addis Ababa region.

To know land lease price, police and regulation of other regional state of the country updated information is available at Ethiopian Investment Agency's website www.eia.gov.et on the factor cost.

VI. HUMANRESOURCE AND TRAINING REQUIREMENT

A. HUMANRESOURCE REQUIREMENT

The plant will be able to employ 54 persons. Annual salary requirement, including employee's benefit, will be Birr 1.46 million. The mix of production and administrative manpower required for the envisaged plant is shown in Table 6.1.

Table 6.1
HUMAN RESOURCE REQUIREMENT AND LABOR COST

No.	Job Title	No. of Persons	Salary (Birr)	
			Monthly	Annual
1	General Manager	1	5,000	60,000
2	Secretary	1	1,500	18,000
3	Production & Technical Head	1	4,000	48,000
4	Personnel	1	3,200	38,400
5	Accountant	1	2,500	30,000
6	Cashier	1	1,400	16,800
7	Sales person	1	2,000	24,000
8	Purchaser	1	2,000	24,000
9	Store Keeper	1	1,400	16,800
10	Quality Controller	1	3,000	36,000
11	Operators	15	18,000	216,000
12	Driver	1	1,200	14,400
13	Guard	2	1,600	19,200
	Sub – Total	28		561,600
	Employee's Benefit 15% basic salary			84,240
	Grand Total			645,840

B. TRAINING REQUIREMENT

It is proposed that production workers (tailors), designers and maintenance crew shall be given appropriate on-site training in the design, manufacture, quality control and operation of children's cloth, and on maintenance and operation of machinery. Such training programme should be incorporated in the contract agreement of the supply of knowhow and machinery. Estimated cost of on-site training of this nature is about Birr 120,000.

VII. FINANCIAL ANALYSIS

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

Construction period	1 year
Source of finance	30 % equity and 70% loan
Tax holidays	5 years
Bank interest	10%
Discount cash flow	10%
Accounts receivable	30 days
Raw material local	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 11.85 million (see Table 7.1). From the total investment cost, the highest share (Birr 10.05 million or 84.83%) is accounted by fixed investment cost followed by pre operation cost (1.27 million or 10.74%) and initial working capital (Birr 525.74 thousand or 4.44%). From the total investment cost, Birr 3.67 million or 30.97% 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	53.20		53.20	0.45
1.2	Building and civil work	4,500.00		4,500.00	37.97
1.3	Machinery and equipment	1,230.00	3,670.00	4,900.00	41.35
1.4	Vehicles	450.00		450.00	3.80
1.5	Office furniture and equipment	150.00		150.00	1.27
	Sub total	6,383.20	3,670.00	10,053.20	84.83
2	Pre operating cost *				
2.1	Pre operating cost	497.00		497.00	4.19
2.2	Interest during construction	775.32		775.32	6.54
	Sub total	1,272.32		1,272.32	10.74
3	Working capital **	525.74		525.74	4.44
	Grand Total	8,181.26	3,670.00	11,851.26	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 840.16 thousand. However, only the initial working capital of Birr 525.79 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 5.38 million (see Table 7.2). The cost of raw material account for 37.51% of the production cost. The other major components of the production cost are depreciation, financial cost, direct labor, and cost of marketing and distribution which account for 25.35%, 11.88%, 10.44%, and 5.57%, respectively. The remaining 9.25% is the share of utility, repair and maintenance, 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 (i000 Birr)	%
Raw Material and Inputs	2,019	37.51
Utilities	117	2.17
Maintenance and repair	147	2.73
Labor direct	562	10.44
Labor overheads	84	1.56
Administration Costs	150	2.79
Land lease cost	0	0.00
Cost of marketing and distribution	300	5.57
Total Operating Costs	3,379	62.77
Depreciation	1,364	25.35
Cost of Finance	640	11.88
Total Production Cost	5,383	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 957 thousand to Birr 2.21 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 19.17 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.

$$\text{Break- Even Sales Value} = \frac{\text{Fixed Cost} + \text{Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 2,551,500$$

$$\text{Break -Even Capacity utilization} = \frac{\text{Break -even Sales Value}}{\text{Sales revenue}} \times 100 = 46.08\%$$

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 4 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 23.08% 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 7.62 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 54 persons. The project will generate Birr 5.27 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 yarn factories and also generates other income for the Government.

Appendix 7.A

FINANCIAL ANALYSES SUPPORTING TABLES

Appendix 7.A.1
NET WORKING CAPITAL (in 000 Birr)

Items	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Total inventory	353.33	403.80	454.28	504.75	504.75	504.75	504.75	504.75	504.75	504.75
Accounts receivable	204.61	230.27	255.93	281.58	283.01	283.01	283.01	283.01	283.01	283.01
Cash-in-hand	9.17	10.48	11.79	13.10	13.33	13.33	13.33	13.33	13.33	13.33
CURRENT ASSETS	567.10	644.54	721.99	799.43	801.09	801.09	801.09	801.09	801.09	801.09
Accounts payable	41.36	47.27	53.18	59.08	59.08	59.08	59.08	59.08	59.08	59.08
CURRENT LIABILITIES	41.36	47.27	53.18	59.08	59.08	59.08	59.08	59.08	59.08	59.08
TOTAL WORKING CAPITAL	525.74	597.28	668.81	740.35	742.01	742.01	742.01	742.01	742.01	742.01

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	1,413	1,615	1,817	2,019	2,019	2,019	2,019	2,019	2,019	2,019
Utilities	82	94	105	117	117	117	117	117	117	117
Maintenance and repair	103	118	132	147	147	147	147	147	147	147
Labour direct	393	450	506	562	562	562	562	562	562	562
Labour overheads	59	67	76	84	84	84	84	84	84	84
Administration Costs	105	120	135	150	150	150	150	150	150	150
Land lease cost	0	0	0	0	17	17	17	17	17	17
Cost of marketing and distribution	300	300	300	300	300	300	300	300	300	300
Total Operating Costs	2,455	2,763	3,071	3,379	3,396	3,396	3,396	3,396	3,396	3,396
Depreciation	1,364	1,364	1,364	1,364	1,364	195	195	195	195	195
Cost of Finance	0	853	746	640	533	426	320	213	107	0
Total Production Cost	3,820	4,980	5,182	5,383	5,294	4,018	3,911	3,804	3,698	3,591

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	4,725	6,075	6,750	6,750	6,750	6,750	6,750	6,750	6,750	6,750
Less variable costs	2,155	2,463	2,771	3,079	3,079	3,079	3,079	3,079	3,079	3,079
VARIABLE MARGIN	2,570	3,612	3,979	3,671	3,671	3,671	3,671	3,671	3,671	3,671
in % of sales revenue	54.39	59.45	58.95	54.39	54.39	54.39	54.39	54.39	54.39	54.39
Less fixed costs	1,664	1,664	1,664	1,664	1,682	512	512	512	512	512
OPERATIONAL MARGIN	905	1,947	2,315	2,007	1,990	3,159	3,159	3,159	3,159	3,159
in % of sales revenue	19.16	32.06	34.29	29.73	29.47	46.80	46.80	46.80	46.80	46.80
Financial costs		853	746	640	533	426	320	213	107	0
GROSS PROFIT	905	1,095	1,568	1,367	1,456	2,732	2,839	2,946	3,052	3,159
in % of sales revenue	19.16	18.02	23.23	20.25	21.58	40.48	42.06	43.64	45.22	46.80
Income (corporate) tax	0	0	0	410	437	820	852	884	916	948
NET PROFIT	905	1,095	1,568	957	1,020	1,913	1,987	2,062	2,137	2,211
in % of sales revenue	19.16	18.02	23.23	14.18	15.10	28.34	29.44	30.55	31.65	32.76

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	10,550	6,067	6,081	6,756	6,750	6,750	6,750	6,750	6,750	6,750	6,750	4,271
Inflow funds	10,550	1,342	6	6	0	0	0	0	0	0	0	0
Inflow operation	0	4,725	6,075	6,750	6,750	6,750	6,750	6,750	6,750	6,750	6,750	0
Other income	0	0	0	0	0	0	0	0	0	0	0	4,271
TOTAL CASH OUTFLOW	10,550	3,798	4,760	4,961	5,572	5,434	5,708	5,634	5,559	5,484	4,344	0
Increase in fixed assets	10,550	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	567	77	77	77	2	0	0	0	0	0	0
Operating costs	0	2,155	2,463	2,771	3,079	3,096	3,096	3,096	3,096	3,096	3,096	0
Marketing and Distribution cost	0	300	300	300	300	300	300	300	300	300	300	0
Income tax	0	0	0	0	410	437	820	852	884	916	948	0
Financial costs	0	775	853	746	640	533	426	320	213	107	0	0
Loan repayment	0	0	1,066	1,066	1,066	1,066	1,066	1,066	1,066	1,066	0	0
SURPLUS (DEFICIT)	0	2,270	1,321	1,795	1,178	1,316	1,042	1,116	1,191	1,266	2,406	4,271
CUMULATIVE CASH BALANCE	0	2,270	3,591	5,386	6,564	7,880	8,922	10,038	11,229	12,495	14,901	19,171

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	4,725	6,075	6,750	6,750	6,750	6,750	6,750	6,750	6,750	6,750	4,271
Inflow operation	0	4,725	6,075	6,750	6,750	6,750	6,750	6,750	6,750	6,750	6,750	0
Other income	0	0	0	0	0	0	0	0	0	0	0	4,271
TOTAL CASH OUTFLOW	11,076	2,527	2,835	3,143	3,791	3,833	4,216	4,248	4,280	4,312	4,344	0
Increase in fixed assets	10,550	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	526	72	72	72	2	0	0	0	0	0	0	0
Operating costs	0	2,155	2,463	2,771	3,079	3,096	3,096	3,096	3,096	3,096	3,096	0
Marketing and Distribution cost	0	300	300	300	300	300	300	300	300	300	300	0
Income (corporate) tax		0	0	0	410	437	820	852	884	916	948	0
NET CASH FLOW	-11,076	2,198	3,240	3,607	2,959	2,917	2,534	2,502	2,470	2,438	2,406	4,271
CUMULATIVE NET CASH FLOW	-11,076	-8,878	-5,638	-2,030	929	3,846	6,380	8,882	11,353	13,791	16,197	20,468
Net present value	-11,076	1,998	2,678	2,710	2,021	1,811	1,430	1,284	1,152	1,034	928	1,646
Cumulative net present value	-11,076	-9,078	-6,400	-3,689	-1,668	143	1,573	2,857	4,010	5,044	5,972	7,618

NET PRESENT VALUE 7,618
INTERNAL RATE OF RETURN 23.08%
NORMAL PAYBACK 4 years