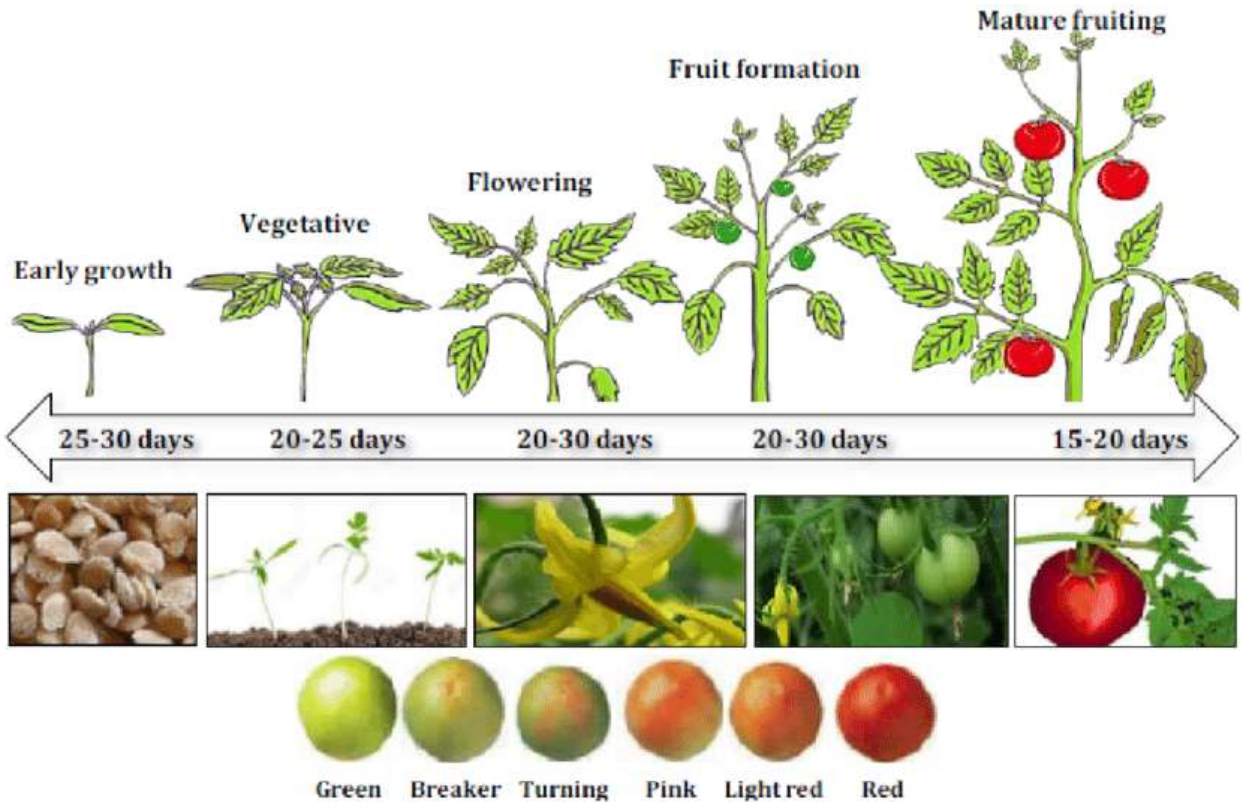
PROJECT PROFILE ON TOMATO FARM



NOVEMBER 26, 2022

ADDIS ABEBA CITY ADMINISTRATION INVESTMENT COMMISSION

TABLE OF CONTENT

LIST OF TABLES

I. Executive summary

This project profile is prepared to assess the viability of running Tomato farming, in Addis Abeba city administration. Hence Market, Technical, Organizational and Financial study was made to investigate the viability of the envisaged project.

This project profile on Tomato farming has been developed to support the decision –making process based on a cost benefit analysis of the actual project viability. This profile includes marketing study, production and financial analysis, which are utilized to assist the decision-makers when determining if the business concept is viable. In Ethiopia there are large scales and medium Tomato farming business. Based on the data obtained from Ethiopian investment commission there are 126 registered companies to invest on vegetables and fruit farming business and out of them only 29 companies are on operational stage while others are on implementation and pre implementation stages

The location of the plant will be decided on the basis of access to raw materials, infrastructure namely power, water, transport and telecom to easy access to international market.

The farm at full capacity operation can produce 50,000 quintals, per year based on 365 working days and their shifts of 24 hours per day.

The total investment capital including establishing the factory is Birr 317 million. Out of the total investment capital, the owners will cover Birr 95 million (30 %) while the remaining balances amounting to Birr 222 million (70 %) will be secured from bank in the form of term loan.

As indicated in the financial study, the cash flow projection of the project shows surplus from the first year on. The net cash flows of the project range from Birr 3.68 Million in the first year to Birr

9.80 million at the end of the 10th year of operation. At the end of the 10th year of operation period the cumulative cash balance reaches Birr 124.61 million. The Benefit-cost ratio and Net present value (NPV) have been calculated at 17% discount factor (D.F) for 10 years of the project activity. Accordingly, the project has NPV of 20 million Birr at 17%D.F. and the benefit-cost ratio of 1.03 at 17% D.F.

Therefore, from the aforementioned overall market technical and financial analysis we can conclude that the Tomato farming business is a viable and worthwhile.

1. Background information

1.1. Introduction

This document was undertaken to show Tomato farming investment profile in Addis Ababa. In compiling the report, information from Addis Ababa investment commission, Addis Ababa trade and industry development, Ethiopian custom commission and published sources have been augmented.

Presently, in spite of high demand and its crucial importance, Tomato farming products are in short supply and also significant amounts are exported to abroad.

The provision of adequate Tomato farming is fundamental importance to Ethiopia's present and future demand. In Ethiopia, the demand for Tomato farming products is expected to increase considerably in the next few decades as a result of increased population growth, urbanization and increasing income levels. Thus, identifying potential of Tomato farming production is crucial in a country like Ethiopia to export.

1.2. Product description

The **tomato** is the edible berry of the plant ***Solanum lycopersicum***, commonly known as the tomato plant. Tomatoes are a significant source of umami flavor. They are consumed in diverse ways: raw or cooked, and in many dishes, sauces, salads, and drinks. While tomatoes are fruits—botanically classified as berries—they are commonly used culinarily as a vegetable ingredient or side dish

1.3. Project location and justification

1.3.1. Location of Addis Ababa

Addis Ababa is the seat of the Ethiopian federal government. It is located on the central highlands of Ethiopia in the middle of Oromia Region. The absolute location is around the intersection point of 901'48''N latitude and 38°44′24″E longitudes. This is very near to the geographical center of the country. It is, therefore, equidistant to the peripheral areas or is equally accessible to almost all parts of Ethiopia. Addis Ababa is located on a well-watered plateau surrounded by hills and mountains. The city is in the highlands on the edge of the Ethiopian rift valley or the eastern slopes of the Entoto Mountain ranges bordering the Great Rift Valley. The total area of Addis Ababa is about 540 km^2 of which 18.2 km^2 are rural. Addis Ababa's built-up urban area spans 474 km^2. It is also the largest city in the world located in a landlocked country.

1.3.2. Demography of Addis Ababa

According to the CSA (2013) population projection, Ethiopia's total population reaches about 105 million people in 2022. Of the total population 22.9% (24 million people) live in urban areas. Ethiopia's urban population is expected to triple by 2037 (World Bank, 2015). Addis Ababa hosts an estimated 3,859,638 people. Currently, Addis Ababa is experiencing an annual growth rate of 3.8% and is estimated to reach 4,696,629 inhabitants by 2032 (CSA, 2015).

1.3.3. Economic activity of Addis Ababa

The transformation of Addis Ababa has especially been rapid since 1991. According to the data from the city's Bureau of Finance and Economic Development (2006), per capital income of Addis Ababa has grown from USD 788.48 in 2010 to USD 1,359 in 2015. The city also achieved a decline in the poverty index from a high of 29.6 in 2012 to 22.0 in 2014. Moreover, the current poverty headcount

index for Addis Ababa is estimated at 18.9 while the poverty severity account for 5 and 1.8 index points respectively. Even though, the poverty status of Addis Ababa has an improvement over previous years, there is still much work to be done to curb both the incidence and severity of poverty.

The major contributor to the economic growth of the city is the implementation of publicly financed mega urban projects like condominium housing, the Light Rail Transit, the international airport and industrial zone development (The state of Addis Ababa, 2017). The existence of international large and medium-size enterprises in and around Addis Ababa have also significant role in creating huge opportunity for employment and technology transfer. Furthermore, there are strong demand for goods and services following the existence of many embassies and inter-governmental organizations like the African Union, the United Nations Economic Commission for Africa.

The manufacturing sector's contribution to Addis Ababa's GDP is high. Despite the fact that 86% of the industries in the city are micro and small scale (cottage and handicrafts, and small-scale), the majority of the country's large and medium scale industries are found in the city. Noticeable increases are also registered currently in other aspects of industrial growth.

The service sector is both the largest contributor to the city's economy and the largest employer. It contributes to 76.4% of the city's GDP while industry's share makes up (almost all) the rest. This sector is dominated by three major sub-sectors: Transport and communication; Real estate, Renting and Business services; and Trade, Hotel and Restaurants. According to the state of Ethiopian Cities 2015 report, the service sector has also been responsible for more than 50% of the growth in the estimated annual growth of the city's GDP. Although 75% of employment in the city is also generated in the service sector, a large proportion of the employed work in low skill and low paying

jobs as shop salespersons, petty and 'gullit' traders, sales workers in small shops, domestic helpers or doorkeepers and restaurant service workers.

Analysis of the economic structure of Addis Ababa reveals that the services sectors (63%) dominates with industry (36%) in second place indicating that these sectors account for almost all of the Addis Ababa's GDP (The State of Addis Ababa, 2017).

Addis Ababa has a great share in the economy of the country due to its attractiveness to businesses, companies, individuals and foreign direct investment. Overall primacy index of the city is 24.8 based on urban employment and unemployment survey (CSA 2015). According to the State of Addis Ababa 2017 report, the simultaneous high rates of economic growth and urbanization in Addis Ababa indicates a likely further rising dominance of the city in Ethiopia's economy as well as growing agglomeration of economic activities in and around the city.

1.4. Why is it beneficial to invest in Addis Ababa?

Addis Ababa is the largest and most economically significant city in the country. Ethiopia's urban population share is only 17 percent (as of 2012, World Bank 2015). The city is the only urban area in Ethiopia capable of delivering scale economies in terms of concentrated demand, specialization, diversity and depth of skills, innovation, and technology transfers. Thus, investors will be benefited in getting capable human power from the market.

The capital is the country's main industrial hub. The city dominates industrial capacity in almost all the braches of light manufacturing that Ethiopia prioritizes. As a result Addis Ababa completely dominates production in various subsectors. This can be taken as the political and social stability of the city.

Overall, the city has a beautiful environment, favorable location, and strong industrial base. Its advantage as an economic powerhouse of the country and human resource center are the most attractive features for local and overseas investors.

Moreover, investors will be getting a comprehensive set of incentives for priority sectors. These include:

- Customs duty free privilege on capital goods and construction materials, and on spare parts whose value is not greater than 15% of the imported capital goods' total value.
- Investors have the right to redeem a refund of customs duty paid on inputs (raw materials and components) when buying capital goods or construction materials from local manufacturing industries.
- Income tax exemption of up to 6 years for manufacturing and agro-processing, and up to 9 years for agricultural investment.
- Additional 2-4 years income tax exemption for exporting investors located within industrial parks and 10-15 years exemption for industrial park developers.
- Loss Cary forward for half of the tax holiday period. Several export incentives, including Duty Draw-Back, Voucher, Bonded Factory, and Manufacturing Warehouse, and Export Credit Guarantee schemes.

1.4.1. The city benefit from the investment

The city will be benefited from investment. These are discussed below.

- Employment opportunity

Investment is expected to provide direct and indirect employment. These range from unskilled causal workers, semi-skilled and skilled employees.

- Improving growth of the economy

  Through the use of locally available materials and exporting products, the investment contributes towards growth of the economy by contributing to the growth of domestic product. These eventually attract taxes including VAT which will be payable to the government hence increasing government revenue while the cost of local materials will be payable directly to the producers. In addition, domestic products save foreign exchange and exports also bring money to the country.

2. Marketing study

2.1. Market analysis summary

The current drive and emphasis by the government on the diversification of the industrial base away from the other sector presents an opportunity for production industry to a valuable contribution towards achieving goal. Having undertaken a thorough and comprehensive research of the market we realized that there was a vast opportunity for domestic products. Aware of the fact operating in such a market is largely dependent on good networking, the promoter intends to establish networks and strategic relationships with various wholesalers and retailers to ensure a steady stream of orders. In so doing the owner intend to ensure that the products they produce are of extremely high quality and fully serve the customers purpose.

2.2. The Supply of vegetables (Tomato)

2.2.1. Local Supply and current status

In Ethiopia there are large scales, medium and small scale vegetables farming business. Based on the data obtained from Ethiopian investment commission there are 126 registered companies to invest on vegetables and fruit farming business and out of them only 29 companies are on operational stage while others are on implementation and pre implementation stages.

Table 1 Tomato production, in Ethiopia

Year	Types of crops	Total Area in Hectares	Total production in quintals	Growth rate
2017/18	Tomato	5,235	277,745	
2018/19	Tomato	4,322	235,838	-15%
2019/20	Tomato	6,012	349,473	48%
2020/21	Tomato	6,433	419,483	20%
Average		5,501	320,635	13.25%

2.2.2. Export

The demand of fresh tomato has been met both through export and domestic market.

Table 2 Volume of exported fresh tomato from 2012 to 2021 in kg

Year	Gross weight (in Kg)	Net weight (in Kg)	CIF value in (ETB)	CIF value in USD	Total TAX in ETB	Total Tax USD
2012	22,913,834	19,119,393	126,004,819	7,052,930	0	0
2013	21,995,208	18,079,991	118,700,869	6,313,842	0	0
2014	28,239,892	23,171,717	149,939,358	7,443,523	0	0
2015	35,898,123	29,884,854	196,673,173	9,463,631	0	0
2016	18,922,771	15,742,198	107,129,892	4,960,062	0	0
2017	35,264,408	29,226,358	218,315,543	9,015,008	0	0
2018	33,773,193	27,880,676	234,985,868		0	0
2019	31,212,912	25,186,096	224,233,261		0	0
2020	21,347,986	17,918,196	142,005,575		0	0
2021	27,921,829	23,000,166	237,548,820		0	0

Source: ERCA and compiled by consultant

As it has been shown in table 6 export of fresh tomato which was 19,119,393 kg at the beginning of the period (2012) has increased to 23,000,166 kg by the end of, 2021. A closer observation at the data set reveals that exported fresh tomato over the study period has shown varying patterns. Based on the data obtained from Ethiopia customs Authority, the annual average volume of exported fresh tomato is 22,920,965 kg from 2012 through 2021.

2.2.2.1. Tomato Demand Projection

The demand for tomato is a function of population, price of packaging materials, price of substitutes, and other exogenous factors. The size of population and its growth rate, disposable income prices and culture are few among many variables. For the purpose of this study, attempts have been made to forecast the likely future demand for Tomato on the basis of the following assumptions:

i. Ethiopian population is increased by 2.5% every year

ii. Ethiopian population is 120,202,679 as of today (2022)

iii. Export market will be forecasted by trend adjusted exponential methods

iv. Per capital consumption is 2.74 kg/person/year and increased by 3% every year

Therefore, in order to estimate the demand for Tomato farm products, the consumption approach is considered.

Table 3 Demand projection for tomato

Year	Ethiopian Population	Domestic demand		Export demand	TOTAL DEMAND
		Per capital consumption is estimated to be 2.736 and increased by 3% every year	Total estimated demand IN KG		
2022	120,202,679	2.736	328,874,530	23,000,166	351,874,696
2023	123,207,746	2.818	347,199,428	23,388,243	370,587,671
2024	126,287,940	2.903	366,613,890	23,776,321	390,390,211
2025	129,445,138	2.990	387,040,963	24,164,398	411,205,361
2026	132,681,267	3.079	408,525,621	24,552,475	433,078,096
2027	135,998,298	3.172	431,386,601	24,940,553	456,327,154
2028	139,398,256	3.267	455,414,102	25,328,630	480,742,732
2029	142,883,212	3.365	480,802,008	25,716,707	506,518,715
2030	146,455,292	3.466	507,614,042	26,104,784	533,718,826
2031	150,116,675	3.570	535,916,530	26,492,862	562,409,392
2032	153,869,592	3.677	565,778,490	26,880,939	592,659,429

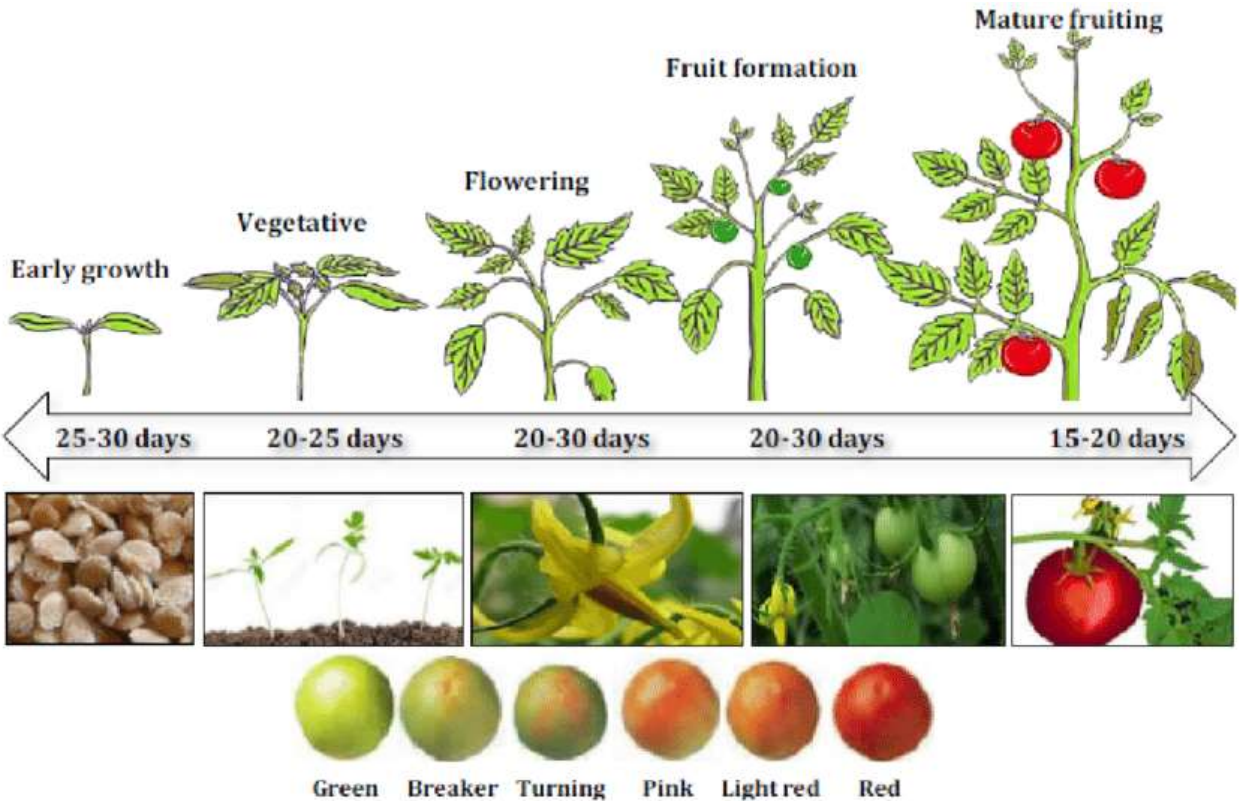
3. Engineering and technology

3.1. Technology

3.1.1. General assumption

GENERAL				
Total area of crop in the field		1	ha	
Total crop cycle duration		23	weeks	
- of which in nursery		7	weeks	
- of which in field		16	weeks	
NURSERY SPECIFICS				
Net # seedling required for 1 ha in the field		27,778	seedlings/ha	
Mortality rate seedlings		10.00%	percentage	
Gross # seedlings required per ha in the field		30,556	seedlings/ha	
Germination rate seed		98.00%	percentage	
# seeds required per ha in the field		31,179	seeds/ha	
# seedlings per nursery bed		2,500.00	seedlings/bed	
# nursery beds required to fill 1 ha in the field		12.47	beds/ha	
Size of 1 nursery bed		12.00	m2	
Nursery area required for 1 ha of plants in the field		0.0150	ha/ha	
Length of ditches + furrow per bed		7	mtr	
Total length of ditches + furrow for 1 ha in the field		87.3	mtr/ha	
FIELD SPECIFICS				
Planting density		27,800	plants/ha	
Length of secondary canals		667	mtr/ha	
Length of primary canals		100	mtr/ha	
POST-HARVEST SPECIFICS				
Yield: TOM2		10.0	MT/ha	
Yield: TOM3		15.0	MT/ha	
Yield: TOM4		15.0	MT/ha	
Yield: TOM5		10.0	MT/ha	

3.1.2. Production stage of tomato crop



3.1.3. Production Capacity and Production Program

3.1.3.1. Plant capacity

The annual production capacity of the farm in full capacity is 50,000 quintals per year. The production capacity is based on projected demand and realistic market share that could be captured. The production commences three shift and 365 working days a year.

3.1.3.2. Production program

The plant initially produces 70 % of its annual rated capacity bound to initial operating problems such as machine set up and marketing. The production capacity will increase by 10 % and attain its full capacity by the fourth year of its commencement.

Table 4 Production program

	Period		Start-up			Full Capacity	
	Capacity utilization		70%	80%	90%	100%	100%
	Project year	u/m	1	2	3	4	5
1	Tomatoes	Quintals	35000	40,000	45,000	50,000	50,000

3.1.4. Environmental and social impact assessment of the project

Typically, any developmental projects also trigger a set of environmental and social impacts. These environmental and social due to development projects occur in different forms. An Environmental and Social Impact Assessment (ESIA) has to be carried out to study the potential environmental and social impacts due to the production vegetables. Potential environmental and social impacts due to the production of vegetable farming products on attributes like air quality, noise, water quality, soil, flora, socio-economic, etc. have to be assessed as part of the ESIA study. Appropriate mitigation measures to help minimize/avoid impacts from the development have to be recommended in the study. The measures include avoidance measures, mitigation measures and environmental enhancement measures. For the purpose of including environmental costs, the costs of wastewater treatment plant and solid waste incineration systems are included in the cost of machinery and equipment. Social responsibility cost estimated to be 1% of fixed investment costs.

3.2. Engineering

3.2.1. Land, buildings and civil works

The required area (m^2) and construction cost for the production facilities essential for the successful operation of the processing plant is shown in Table 5. A total area ready for the processing plant is 41 ha out of which 40 ha is for growing Tomato and others are for related facilities. In order to estimate the land lease cost of the project profiles it is assumed that all the project will be located in different land level from level 1/1 to level 4/3, their current market lease price is from 39,073.31 birr per M^2 to 2,800.71 birr per M^2respectively. Therefore, for the profile a land lease rate of birr 3,885 per M^2 have been taken, which is between the ranges.

The cost of construction of building should be appropriate to the size and expected profitability of business, costs of building generally differs by the type of construction materials used, the type of foundation, wall height and location. The current building cost for simple storage and processing room is from 1,800.00 Birr per m^2 to 25,000 Birr per m^2..The total construction cost of buildings and civil works, is estimated at Birr 37.96 million. Therefore, the total cost of land lease and construction of buildings and civil works is estimated at Birr 259.96 million.

The proposed plant layout comprises the following buildings and structures.

Table 5 Building costs

Nº	Description	Unit	Quantity	Unit cost	Total cost
1	Land for growing Tomato	M^2	400,000	0.0	0.00
3	Mother plant block	LS			5,000,000.00
4	Irrigation with pipeline	M^2			5,000,000.00
5	Preparation of land, nursery beds, internal roads, pathways	M^2			5,000,000.00
6	Propagation kit	Required			2,000,000.00
7	Office building	M^2	200	20,000	4,000,000.00
8	Compound fencing	LS			15,000,000.00
9	Guard house	M^2	6	20,000	120,000.00
10	Toilet and shower	M^2	20	20,000	400,000.00
11	Common Septic tank	M^3	72	20,000	1,440,000.00
	Total				37,960,000.00

Table 6 Land lease period in Addis Abeba

Sector of development activity	Period of lease	Down payment
Education, health, culture and sports	90	10%
Industry (manufacturing)	70	10%
commerce	60	10%
For urban agriculture	15	10%
For others	60	10%

Sources: - city government of Addis Abeba land development and management bureau

Table 7 Land lease floor price in Addis Abeba

S/No	Land level	Current land lease floor price per M^2	Current lease price per M^2 (Market price)
1	1/1	2,213.25	39,073.31
2	1/2	2,165.47	36,825.73
3	1/3	1,900.19	34,578.15
4	¼	1,552.93	31,119.21
5	1/5	1,531.91	29,096.45
6	2/1	1327.39	27,073.71
7	2/2	1,221.18	25,050.96
8	2/3	1,191.17	23,028.21
9	2/4	1,074.39	21,005.46
10	2/5	1,027.84	18,982.71
11	3/1	994.71	16,959.96
12	3/2	960.21	14,937.21
13	3/3	927.84	12,914.46
14	¾	904.77	10,891.71
15	3/5	873.74	8,868.96
16	4/1	814.06	6,846.21
17	4/2	786.45	4,823.46
18	4/3	748.80	2,800.71

Sources: - city government of Addis Abeba land development and management bureau

4. Tomato farm organizational structure

The selection of structure of the envisaged project is made based on the existing structure of manufacturing plants operating in the country, the capacity, complexity and technology mix of the plant. Organizational structure principles such as specialization, coordination, and departmentalization are also considered for design of structure that best suits the envisaged project

4.1. Manpower Requirement and Estimated Annual manpower costs

Table 8 Annual manpower costs

N^{O}	Vacancy	Amount	Monthly salary	Total yearly salary
1	General manager	1	40,000	480,000.00
2	Technical manager	1	30,000	360,000.00
3	Agronomy	1	20,000	240,000.00
4	Accountant	1	11,500	138,000.00
5	Cashier, & purchaser	1	8,000	96,000.00
6	Product seller	1	17,000	204,000.00
7	Store keeper	1	7,000	84,000.00
8	Record keeper	1	8,000	96,000.00
9	Agronomist	8	9,000	864,000.00
10	Semiskilled labor	50	5,000	3,000,000.00
13	Guards	4	4,000	192,000.00
14	Commercial manager	1	15,000	180,000.00
15	Driver	2	10,000	240,000.00
Total		73		6,174,000.00

5. Financial Analysis

5.1. General

The financial analysis evaluation, under consideration has been carried out for Tomato farm production cost estimates of the envisaged factory are mainly consisted of capital investment as well as operating and maintenance costs. The capital investment costs include fixed investment costs (initial fixed investment and replacement costs) and working capital, while operating and maintenance costs comprise current expenses related to material inputs, labor, utility, repair and maintenance costs, spare parts, Overheads, Sales and distribution, interest and depreciation expenses.

The financial analysis and evaluation has been conducted taking assumptions:

1. It is assumed that about 70% of the total capital investment costs including the working capital requirement could be covered through development bank loans of short and long-term credits. The remaining balance 30% will be covered by equity capital contribution of the project owner.
2. Even though the project might secure loans under different term and conditions as well as from different financial sources, for the purpose of calculation of debt service scheduling, the current development bank of Ethiopia credit terms and conditions have been used. Consequently. It is assumed that the project will secure loan facility on the basis of 11.5 % annual interest rate, and 10 years' equal installments.
3. Even though the estimated project production life is more 10 years, the financial analysis has been undertaken for a period interval covering the first 10 years only, during which time most of the capital assets are assumed to be deprecated, debts recovered and pay-back period accomplished.

4. It is assumed that the project will be start up production activity at 70 % capacity. During years 2 & year 3 the projects is anticipated to gradually increase capacity utilization to reach 100% in year 4. Therefore, starting from year 4 the project will be operational at full capacity.
5. For the project under reference promotional, sales and distribution expenses have been estimated at 3% of the sales revenue.
6. Maintenance and spare parts costs are 1.5% of the fixed investment costs.
7. Others assumption

5.2. Initial Fixed investment costs

Table 9 Initial Fixed investment costs

S/No	Fixed investment type	Unit of measurement	Quantity	Unit price	Total Amount	Remarks
1	Land	Square meter	400,000	3,885 birr/M^2	222,000.00	The period of land lease will be 70 years and 10% of the total lease amount will be paid in the first year
2	Buildings and civil works	Square meter	5,898	lump sum	37,960,000.00	
	Sub total				**259,960,000.00**	
3	Machineries	set	2	Lump sum	30,000,000.00	
4	Transformer	set	1	Lump sum	2,000,000.00	
5	Weighbridge	Set	1	Lump sum	4,000,000.00	
6	Truck and vehicles	Pcs	2	Lump sum	6,000,000.00	
7	Furniture and fixture	Pcs			500,000.00	
	SUB TOTAL				42,500,000.00	
	Fixed capital investment costs				302,460,000.00	
8	pre-operational expenses				2,000,000.00	
	Working capital				12,533,000.00	
	TOTAL INVESTMENT COSTS				316,993,000.00	

5.2. Working capital

Working capital is the financial means required for smooth operation and maintenance of a project mathematically, it is a difference between current assets and current liabilities. In the particular case of the project under consideration, the current assets comprise receivables, inventories (local and imported material inputs, spare parts, work in progress, and products ready for delivery) and cash in hand, while current liabilities comprise accounts payable to creditors.

5.3. Project Financing

Fixed capital investment costs and working capital requirements are assumed to be financed by equity capital of the owner and through loans of short and long-term credits.

As stated earlier even though the company obtains loans under different terms and condition as well as from different sources, for the purpose of calculation of debt service scheduling the current development bank of Ethiopia credit terms and conditions have been used. Accordingly it is assumed that the company will be able to obtain loan 70% of the total investment costs for construction of different buildings for purchase of machineries, for purchase of truck and vehicles, for working capital and for purchase of office furniture and pre operation expense will be covered through bank loans that will have to be repaid back within 10 years, during which time interest will be paid on the loan. The remaining balance that of 30% of the total investment costs will be expected to be covered by equity contribution of the project promoter.

5.4. Production costs

As it is depicted in Annex Table 15 major categories of the total production costs are assembled into the following cost elements.

5.4.1. Material inputs

In the project under study the basic material inputs are seedlings, fertilizers, insecticides and packing materials etc. Therefore, the current prevailing local and international market prices have been used for estimation of material inputs costs. At full capacity operation the material inputs costs are estimated at Birr 58.50 million per annum.

Table 10 Raw materials input plan in Birr

	Period				Start-up			Full Capacity
	Capacity utilization				70%	80%	90%	100%
	Project year				1	2	3	4
	Materials input	Unit of measure	Quantity at full Capacity	Unit price				
1	Seedlings	Number	2,222,240	25	38,889	44,445	50,000	55,556
2	Fertilizer	Quintals	120	4,800	403	461	518	576
3	Insecticides	Liters	125	550	48	54	61	68
4	Herbicides	Liters	125	1,000	86	100	113	125
5	Fungicides	Liters	36	650	16	18	21	23
6	Other chemicals	Ls	150		105	120	135	150
7	Machinery costs	Ls	2,000		1,400	1,600	1,800	2,000
	Total				40,947	46,798	52,648	58,498

5.4.2. Utilities

In estimating costs of utility expenses for operation and maintenance of the project, Costs of fuel, oil and lubricant, electricity and water consumptions have been taken in to consideration, the rates of which have been estimated on the basis of the proposed capacity utilization program of the project and at the current official charging rates. At full capacity operation the project will have the following utility expense per annum which amounts to Birr 4.66 million.

Table 11 Utilities of the factory'000"Birr

Utility"000"Birr		Start-up			Full Capacity
Capacity utilization		70 %	80 %	90 %	100 %
Project year		1	2	3	4
Item description	Unit of measurement				
Fuel					
Gasoline for service vehicle	100km*260days*37Birr/LIT*8km/Li	84.18	96.20	108.1	120.25
Gasoline for transport truck	(200km*300days*37Birr/LIT*5km/Li)	932	1,066	1,199	1,332
Sub-Total		1016	1162	1307	1452
Change of oil and lubricant	10% of the fuel consumption	102	116	131	145
Sub-Total		1,118	1,278	1,438	1,597
Electricity	260days*24 hrs*600kwh* 0.69Birr/kwh	1,808	2,066	2,325	2,583
Sub- Total		1,808	2,066	2,325	2,583
Water	365days*100m^3/day*10 Birr/m^3	255.50	292.00	328.50	365.00
Sub -Total		255.50	292.00	328.50	365.00
Telecommunication					
Telephone	5 lines* 500Birr/month/line+18Birr/line/month	31.08	31.08	31.08	31.08
Mobile	5 lines*500 Birr/month/line	30.00	30.00	30.00	30.00
Fax	2line*1,000Birr/month + 17 Birr/line/month	24.40	24.40	24.40	24.40
Internet	2,500 Birr/month	30.00	30.00	30.00	30.00
Sub-Total		**115.48**	**115.48**	**115.48**	**115.48**
TOTAL		**3,297.00**	**3,752.00**	**4,207.00**	**4,661.00**

5.4.3. Repair and maintenance

In the expenses under this title have been considered cost estimates required for annual repair and maintenance works including spare parts expenses. These costs include the annual repair expenses of structures and civil works as well as repair and maintenance expenses of machinery and equipment including accessory and general service facilities. The repair and maintenance and spare parts costs have been assumed to be (1.5% of fixed costs and spare part costs).

5.4.4. Salaries and wages

The costs of salaries have been calculated in accordance with the manning list proposed under the "organization and Management" section of this study. In the estimation of salaries and wages, the official minimum wage has been taken in to account. At full capacity operation the costs of salaries and wages will amount to Birr 6.17 Million.

5.4.5. Over heads

In the expenses under this title have been included land and building taxes, buildings, vehicles as well as machinery and equipment insurance, vehicles annual inspection; postage, telephone and e. mail, stationery and office supplies; printing and copying; audit fee; cash indemnity etc. The overhead costs and divided in to direct overheads and administration overheads.

Table 12 Overhead costs

Direct Overhead"000"Birr		Year 1	Year 2	Year 3	Year 4
Annual land lease Payment					
Insurance					
Building and Civil works	0.10%	38	38	38	38
Machinery and Equipment	0.20%	60	60	60	60
Motor vehicle and Truck	1%	60.00	60.00	60.00	60.00
Vehicles annual inspection and registration	25,000 Birr per annum per vehicle	50.00	50.00	50.00	50.00
Work cloth	Two times per annum per workers at 800 Birr	117	117	117	117
Cleaning and sanitation	An estimate of 300 Birr/day	78.00	78.00	78.00	78.00
Sub Total		403	403	403	403
Administration Overhead "000' Birr					
Audit fee	40,000 Birr per annum	40.00	40.00	40.00	40.00
Office cleaning and sanitation	2,000 Birr per month	24.00	24.00	24.00	24.00
Stationery and office supplies	2,000 Birr per month	20.00	20.00	20.00	20.00
Printing and Copy	2,000 Birr per month	24.00	24.00	24.00	24.00
Sub Total		**108.00**	**108.00**	**108.00**	**108.00**
GRAND TOTAL		**511**	**511**	**511**	**511**

5.4.6. Financial costs

As it has been outlined earlier under" project Financing" the current Development Bank of Ethiopia credit terms and conditions for newly establishing projects have been used to compute the financial costs, estimated to be incurred in connection with that of the total investment costs assumed to be covered through loan financing. The amount of the loan capital to be obtained and the financial costs to be incurred thereof have been determined depending on the amount of fixed investment cost and pre-production expenses.

5.4.7. Depreciation

Depreciation charges should be taken in to account as part of the total production costs in order to calculate the total production costs, the net working capital and the gross or net-profit. For the given project under reference, the fixed assets and the pre-production capital expenditures have been depreciated and amortized respectively on "a straight line" depreciation method basis using the following rates of the original acquisition costs of the assets:

The rationale uses for the estimation of the depreciation and the amortization rates is based on the expected service life of the assets and repayment capacity of the project under consideration. Based on the above charging rates and consideration of the above facts, the total annual depreciation cost at full capacity operation have been estimated at Birr 8.80 million.

Table 13 Depreciation in Birr"000"

Period			Start-up			
Capacity utilization			70 %	80 %	90 %	100 %
Project year			1	2	3	4
Item description	Original Value					
Structure and civil works	37,960,000.00	5% of original value	1,898	1,898	1,898	1,898
Machinery and equipment	30,000,000.00	15 % of original value	4,500	4,500	4,500	4,500
Transformer	2,000,000.00	15 % of original value	300.00	300.00	300.00	300.00
Motor vehicles and trucks	6,000,000.00	15 % of original value	900.00	900.00	900.00	900.00
Weighbridge	4,000,000.00	15 % of original value	600.00	600.00	600.00	600.00
Office equipment and furniture	500,000.00	20% of original value	100.00	100.00	100.00	100.00
Pre-operation expense	2,000,000.00	25% of original value	500.00	500.00	500.00	500.00
Total			8,798	8,798	8,798	8,798

5.5. Break Even point and ROI

5.5.1. Break Even point (BEP)

Three kinds of break-even point

A. BEP Sales Revenue(BR)

B. BEP production (Volume)

C. BEP Percentage (%)

A. Break-even point(BEP) Sales

To determine BEP Annual Sales, multiply annual sales found in income statement by the annual fixed cost, and divided by Annual sales less Annual variable cost.

$$\text{BEP (sales)} = = \frac{\text{Annual sales x Annual fixed costs}}{\text{Annual sales} - \text{Annual variables costs}}$$

Annual sales = 105,000,000 Birr

$$\text{BEP (sales)} = = \frac{\text{Annual sales x Annual fixed costs}}{\text{Annual sales} - \text{Annual variables costs}} = = \frac{105{,}000{,}000 \text{ x } 41{,}001{,}000}{105{,}000{,}000 - 51{,}931{,}000}$$

BEP (Sales) = 81,122,784 Birr

B. $$\text{BEP percentage} = \frac{\text{Annual fixed costs x } 100\%}{\text{Annual sales} - \text{Annual variables costs}}$$

$$= \frac{41{,}001{,}000 \text{ x } 100\%}{105{,}000{,}000 - 51{,}931{,}000}$$

= 77%

5.5.2. Return on investment

Return on investment = Net profit /Total capital requirement

= 27,174,000/316,993,000

= 8.5%

The return on owners' investment (ROOI)

= Annual net profit /owners' investment

= 27,174,000/95,097,900

= 28.57%

5.6. Project costs

Project capital investment costs are the sum of fixed capital investment (fixed investment plus pre-production capital expenses) and net working capital at full capacity, with fixed capital constituting the resources required for constructions and civil works, importation and installation of production machinery and equipment and general service facilities, whereas, the working capital corresponding to the resources needed for operation of the project totally and partially.

As it has been revealed in Annex Table 15 the total annual operating costs excluding depreciation and interest are estimated to range from 58.60 million Birr in year 1 to 78.88 million Birr in year 4 and then after remain constant for the rest of the project life.

The total annual production costs including depreciation and interest increase from 373 million Birr in year 1 to 93 million Birr in year 4 then starts declining until it reaches 85 million Birr in year 10.

5.7. Project benefits

For financial analysis and evaluation of the given project, the current material input price, and packing materials buying price and final products price at the project gate has been taken as a basis. As it has been stated earlier the project is envisaged to reach full capacity operation four years after

commencement of production activities which are assumed to begin with 70% of the estimated total capacity.

At full capacity operation the project is envisaged to have the following revenue components.

Table 14 Source of revenue in Birr"000"

	Period		Start-up			Full Capacity	
	Capacity utilization		70%	80%	90%	100%	100%
	Project year		1	2	3	4	5
	Product type	At full capacity					
1	Tomatoes	50,000	105,000	120,000	135,000	150,000	150,000
	Total		105,000	120,000	135,000	150,000	150,000

Thus, according to the computation in Annex Table 7and Annex Table 19, the net income and cash flow statements analysis revealed that at full capacity operation the project will generate a total income (gross revenue) amounting to 150 million Birr per annum. The corresponding Annex Table 17 of "Net Income Statement" shows a steady growth of gross profit starting from 12 million Birr in year 1 reaching the peak of 65 million Birr in year 10. In its 10 years of manufacturing activities, the project is expected to generate a total net profit of 283 million Birr and contribute 152 million Birr to the government treasury in form of 35% income tax.

According to the current investment Law, machinery and equipment are anticipated to be imported duty- free. The liquidity position of the project is very strong. The corresponding Annex Table 19 of "Cash Flow Statement" shows the positive cumulative cash balance of Birr 125 million and the project will not face any cash shortage throughout its production life.

The computation of the pay-back period as depicted in Annex table 24 indicates that the project will be able to reimburse itself from its net cash-income within ten years after commencement of production activities, the period which is considered to be very good for the project of this nature.

In Annex Table 25 of the Benefit-cost ratio and Net present value (NPV) have been calculated at 17% discount factor (D.F) for 10 years of the project activity. Accordingly, the project has NPV of 20 million Birr at 17%D.F. and the benefit-cost ratio of 1.03 at 17% D.F. these results are most appreciable, especially, when related to the external capital borrowing interest rate which ranges from 8.50% to 18.5 % for newly establishing projects.

The project under study when implemented will have BEP at about 77% operation of the estimated full capacity. In addition to this, finally, summary of financial efficiency tests have been conducted in Annex table 23, Accordingly, all efficiency ratios indicated positive trends and consequently, it can be inferred that the project can operate in the frame work of free market mechanism on commercially and financially viable basis and is remunerative.

ANNEXES

ANNEX II

CALCULATION OF ANNUAL PRODUCTION COSTS

Table 15 Annual total production costs"000"

Period	Start-up			Full capacity						
Capacity utilization	70 %	80 %	90 %	100 %	100 %					
Project Year	1	2	3	4	5	6	7	8	9	10
Cost category										
I. Material inputs	40,947	46,798	52,648	58,498	58,498	58,498	58,498	58,498	58,498	58,498
II. Labor	6,174	6,174	6,174	6,174	6,174	6,174	6,174	6,174	6,174	6,174
III. Utility	3,297	3,752	4,207	4,661	4,661	4,661	4,661	4,661	4,661	4,661
IV. Repair and Maintenance and spare parts (1.5 % of fixed costs)	4,537	4,537	4,537	4,537	4,537	4,537	4,537	4,537	4,537	4,537
VI Direct overheads	403	403	403	403	403	403	403	403	403	403
A. Direct Production costs	55,358	61,664	67,969	74,273	74,273	74,273	74,273	74,273	74,273	74,273
VII. Administration over head	108	108	108	108	108	108	108	108	108	108
VIII. Marketing and Promotional expense 3 % of sales revenue	3,150	3,600	4,050	4,500	4,500	4,500	4,500	4,500	4,500	4,500
B. Operating costs	58,616	65,372	72,127	78,881	78,881	78,881	78,881	78,881	78,881	78,881
Interest	25,518	24,028	22,367	20,515	18,450	16,148	13,581	10,718	7,527	3,967
Depreciation	8,798	8,798	8,798	8,798	8,298	8,198	6,100	1,898	1,898	1,898
C. Total production costs	92,932	98,198	103,292	108,194	105,629	103,227	98,562	91,497	88,306	84,746

ANNEX IV
CALCULATION OF WORKING CAPITAL REQUIREMENTS

I. Minimum requirement of current assets and liabilities
   A. Accounts receivable: 30 days at total production costs minus depreciation and interest
   B. Inventory
      1. Material inputs: 30days
      2. Spare parts : 90 days
      3. Work under process: two days at direct costs
      4. Product ready for delivery: 8 days at direct costs plus administration overheads
   C. Cash on hand : 90 days
   D. Accounts payable 52 days for material inputs and utilities

ii. Working capital requirement

Table 16 Calculation of working capital

Cost category	Minimum Days of coverage	Coeff-icient of turnover	Project year									
			Start up			Full capacity						
			1	2	3	4	5	6	7	8	9	10
I. Current asset												
A. A/R	26	10	5,862	6,537	7,213	7,888	7,888	7,888	7,888	7,888	7,888	7,888
B. Inventory												
1. Material inputs	26	10	4,095	4,680	5,265	5,850	5,850	5,850	5,850	5,850	5,850	5,850
2. Spare parts	90	4	1,134	1,134	1,134	1,134	1,134	1,134	1,134	1,134	1,134	1,134
3. Work under process	2	130	426	474	523	571	571	571	571	571	571	571
4. Product ready for delivery	8	32.5	1,811	2,005	2,199	2,393	2,393	2,393	2,393	2,393	2,393	2,393
C. Cash on hand			3,630	3,744	3,857	3,971	3,971	3,971	3,971	3,971	3,971	3,971
D. Current assets			16,957	18,574	20,191	21,808	21,808	21,808	21,808	21,808	21,808	21,808
II. Current liabilities A. A/p	26	10	4,424	5,055	5,686	6,316	6,316	6,316	6,316	6,316	6,316	6,316
III. Working capital												
A. Net working capital			12,533	13,519	14,506	15,492	15,492	15,492	15,492	15,492	15,492	15,492
B. Increasing in working capital			12,533	986	986	986	0	0	0	0	0	0

ANNEX VI

PROJECTED NET INCOME STATMENT

Table 17 Projected Net income statement "000"

Period	Start up			Full capacity						
Capacity utilization	70 %	80 %	90 %	100 %						
Project year	1	2	3	4	5	6	7	8	9	10
Item description										
Product sales revenue	105,000	120,000	135,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Less total production costs	92,932	98,198	103,292	108,194	105,629	103,227	98,562	91,497	88,306	84,746
Gross profit	12,068	21,802	31,708	41,806	44,371	46,773	51,438	58,503	61,694	65,254
Tax	4,224	7,631	11,098	14,632	15,530	16,371	18,003	20,476	21,593	22,839
Net profit	7,844	14,171	20,610	27,174	28,841	30,402	33,435	38,027	40,101	42,415
Accumulated undistributed profit	7,844	22,016	42,626	69,800	98,641	129,043	162,478	200,505	240,606	283,021

ANNEX VII
DEBT SERVICE SCHEDULE AND COMPUTATION
PAYMENT OF EQUAL ANNUAL INSTALLMENTS

Table 18 Debt services schedule and computation

Item description	Project year									
	1	2	3	4	5	6	7	8	9	10
A. Investment and working capital										
1. Investment										
2. Increment working capital										
Total										
B. Loan receipts and balances										
1. Loan receipts	221,895									
2. Outstanding balance at end of year										
a. First year loan	221,895	208,941	194,498	178,394	160,438	140,416	118,092	93,201	63,449	34,503
Total										
A. Debt service										
1. First year Loan										
a. Interest	25,518	24,028	22,367	20,515	18,450	16,148	13,581	10,718	7,527	3,967
b. Repayment of principal	12,953	14,443	16,104	17,956	20,021	22,324	24,890	27,753	30,944	34,503

ANNEX VIII
CASH-FLOW STATEMENT
FOR
FINANCIAL PLANING

Table 19 Projected Cash flow statement

Period	Start up			Full capacity						
Capacity utilization	70%	80%	90%	100%						
Project year	1	2	3	4	5	6	7	8	9	10
Item description										
A. Cash - inflow	426,417	121,617	136,617	151,617	150,000	150,000	150,000	150,000	150,000	150,000
1. Financial resource (total)	321,417	1,617	1,617	1,617						
2. Sales revenue	105,000	120,000	135,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
B. Cash – outflow	422,728	113,091	123,313	133,601	132,882	133,724	135,355	137,828	138,945	140,190
1. Total assets schedule including replacement	321,417	1,617	1,617	1,617						
2. Operating costs	58,616	65,372	72,127	78,881	78,881	78,881	78,881	78,881	78,881	78,881
3. Debt service (total)										
a. Interest	25,518	24,028	22,367	20,515	18,450	16,148	13,581	10,718	7,527	3,967
b. Repayment	12,953	14,443	16,104	17,956	20,021	22,324	24,890	27,753	30,944	34,503
4. Tax	4,224	7,631	11,098	14,632	15,530	16,371	18,003	20,476	21,593	22,839
C. Surplus (Deficit)	3,689	8,526	13,304	18,016	17,118	16,276	14,645	12,172	11,055	9,810
D. Cumulative cash balance	3,689	12,215	25,519	43,535	60,653	76,929	91,574	103,746	114,801	124,611

ANNEX XII
TOTAL INVESTMENT COSTS

Table 20 Total investment costs"000"

Period	Start up			Full capacity								
Project year	1	2	3	4	5	6	7	8	9	10	11	
Investment Category												
1. Fixed investment costs												
a. Initial fixed investment costs	302,460											
b. Replacement												
2. Pre-operational capital expenditure	2,000											
3. Working capital increase	12,533	986	986	986								
Total investment costs	316,993	986	986	986								

ANNEX XIII
TOTAL ASSETS

Table 21 Total Assets

Period	Start up			Full capacity								
Project year	1	2	3	4	5	6	7	8	9	10	11	12
Investment Category												
1. Fixed investment costs												
c. Initial fixed investment costs	302,460											
❖ Cost of land												
d. Replacement												
2. Pre-operational capital expenditure	2,000											
3. Current assets increase	16,957	1,617	1,617	1,617								
Total assets	321,417	1,617	1,617	1,617								

ANNEX XIV
SOURCES OF FINANCE

Table 22 Sources of finance

Period	Start up			Full capacity							
Project year	1	2	3	4	5	6	7	8	9	10	Total
Sources of finance											
1. Equity capital	95,098	986	986	986							
2. Loan capital	221,895										
3. Current liabilities	4,424	631	631	630							
Total finance	321,417	1,617	1,617	1,617							

ANNEX XI
SUMMARY OF FINANCIAL EFFECIENCY TESTS

Table 23 Summary of financial efficiency tests

	Project year									
Project year	1	2	3	4	5	6	7	8	9	10
Capacity utilization	70%	80%	90%	100%						
Financial ratio in %										
1. Gross profit : Revenue	11%	18%	23%	28%	30%	31%	34%	39%	41%	44%
2. Net profit : Revenue	7%	12%	15%	18%	19%	20%	22%	25%	27%	28%
3. Net profit : initial investment	2%	4%	6%	8%	9%	10%	10%	12%	13%	13%
4. Net profit : Equity	8%	15%	21%	28%	29%	31%	34%	39%	41%	43%
5. Gross profit : Initial investment	4%	7%	10%	13%	14%	15%	16%	18%	19%	20%
6. Operating costs : Revenue	56%	54%	53%	53%	53%	53%	53%	53%	53%	53%

ANNEX XV

CALCULATIONS OF PAYBACK PERIOD

Table 24 Calculation of payback period"000"

Year	Amount Paid Back			Total investment	End of year
	Net Profit	Depreciation	Total		
1	7,844	8,798	16,642	316,993	-300,351
2	14,171	8,798	22,969	986	-278,368
3	20,610	8,798	29,408	986	-249,946
4	27,174	8,798	35,972	986	-214,960
5	28,841	8,298	37,139		-177,821
6	30,402	8,198	38,600		-139,221
7	33,435	6,100	39,535		-99,686
8	38,027	1,898	39,925		-59,761
9	40,101	1,898	41,999		-17,762
10	42,415	1,898	44,313		+26,551

ANNEX XVI
CALCULATIONS OF NET PRESENT VALUE AT 17% D.F.

Table 25 Calculation of NPV at 17% D.F.

Project year	Gross Revenue	$1/(1+i)^n$ At 17%	Present value at 17%	Project costs			
				Total investment	Operating costs	Total	Present value at 17%
1	105,000	0.854701	89,744	316,993	58,616	375,609	321,033
2	120,000	0.730514	87,662	986	65,372	66,358	48,475
3	135,000	0.624371	84,290	986	72,127	73,113	45,650
4	150,000	0.53365	80,048	986	78,881	79,867	42,621
5	150,000	0.456111	68,417		78,881	78,881	35,978
6	150,000	0.389839	58,476		78,881	78,881	30,751
7	150,000	0.333195	49,979		78,881	78,881	26,283
8	150,000	0.284782	42,717		78,881	78,881	22,464
9	150,000	0.243404	36,511		78,881	78,881	19,200
10	150,000	0.208037	31,206		78,881	78,881	16,410
Total			629,048				608,866

A. Benefit- cost ratio At 17% D.F. = 1.03
B. NPV At 17% D.F. = 20,182,000 Birr