BANANA FARM

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I. SUMMARY

This profile envisages the establishment of a farm for the production of Banana with a capacity of 5,000 tonnes per annum.

The present demand for the proposed product is estimated at 19,830 tonnes per annum. The demand is expected to reach at 28,815 tonnes by the year 2015.

The farm will create employment opportunities for 17 persons.

The total investment requirement is estimated at Birr 4.25 million, out of which Birr 1.22 million is required for plant and machinery.

The project is financially viable with an internal rate of return (IRR) of 15% and a net present value (NPV) of Birr 1.73 million, discounted at 8.5 %.

II. FARM PRODUCT DESCRIPTION AND APPLICATION

Banana believed to be one of the oldest fruits probably originated in the warm moist tropical Asia. The commercial bananas are classified into 3 species 1. dwarf sp.2. tall ones, whose fruits are edible raw 3. Musa prasiadica whose fruits are cooked. The banana plant has good height 3.5 to 7.5 m or more, the stem consists of a column of sheathing petioles of spirally arranged dark to yellowish green leaves which are variable in size having an obtuse and entire but easily torn margins. The Plant, a perennial shrubs, has large starchy , subterranean rhizome studded with buds. Parthino-carpic fruits are formed on the plant.

Rich deposits of still, deep cotton soils with no water stagnations favour the growing of banana. It does well in areas of high rain, warm humid and rainy areas near the tropics sweet banana. Besides, a zone with strong hot wind and freezing temperature during the winter do not find to favour with this fruit crop.

III. MARKET STUDY AND FARM SIZE

A. MARKET STUDY

1. Past Supply and Present Demand

Ethiopia produces banana for both domestic consumption and export. Banana in the country is mostly grown on commercial farms although small farmers also produce in a limited quantity. The export quantity and value of banana in the past recent years is given in Table 3.1.

Table 3.1

EXPORT OF BANANA (2001-2003)

Year	Exported Banana (Tonnes)	Value ('000 Birr)
2001	1,000.0	1698.10
2002	1,265.5	2830.20
2003	1,071.3	1857.20
Total	**3336.8**	**6385.50**
Average	**1112.3**	**2,128.50**

Source: - *Customs Authority***.**

As could be seen from Table 3.1 in the past three years, Ethiopia has been exporting about 1112.3 tonnes of bananas annually on the average. Since there is no detailed data on the supply and demand of banana from both the commercial farms and small holder farmers data obtained from Household, Income, Consumption and Expenditure Survey conducted by CSA has been utilized to estimate the present supply and demand. According to the survey the total domestic consumption of banana in the year 2000 was about 16,630.2 tonnes (see Table 3.2). Assuming an annual average growth of about 3%, the present domestic consumption of banana is estimated at 18,717.4 tonnes. When the average quantity of banana exported in the past three years is added to the domestic consumption, the total present effective demand is about 19,829.7 tonnes.

Table 3.2

BANANA CONSUMPTION BY EXPENDITURE GROUP

Expenditure Group (Birr)	House hold Estimate	Banana Consumption (gm)	Total Consumption (Tonnes)
Below 600	14,660	-	-
600-999	88,153	105	9.3
1,000-1,399	213,078	315	67.1
1,400-1,999	593,706	215	127.6
2,000-2,599	955,548	376	359.3
2,600-3,399	1,641,949	774	1,270.9
3,400-4,199	1,731,550	1,014	1,755.8
4,200-5,399	2,141,178	1,349	2,888.5
5,400-6,599	1,423,497	2037	2,899.7
6,600-8,999	1,430,129	2087	2,984.7
9,000-12,599	750,269	3269	2,452.6
12,600-16,199	244,782	4504	1,102.5
16,200-19,999	95567	6088	581.8
20,000 & Over	140,615	927	130.4
Grand Total	**11464,682**	**1,651**	**16,630.2**

Source*: - Income, Consumption & Expenditure Survey, CSA. 2001*.

2. Projected Demand

The demand for banana is expected to increase with Population growth, increased income, increased attitude of households in consuming fruits and vegetables as well as the wide opportunity for export in neighbouring countries like. Europe and the Middle East. Considering these factors, demand for banana in the domestic and export market is conservatively assumed to grow by about 4%, annually. Assuming current demand approximates supply, the projected demand for local consumption, export and the unsatisfied demand are presented in Table 3.3.

Table 3.3
PROJECTED AND UNSATISFIED DEMAND FOR BANANA (TONNES)

Year	Local Demand	Export Demand	Total Demand	Total Supply	Unsatisfied Demand
2005	19466.1	1156.8	20622.9	19829.7	793.2
2006	20244.7	1230.1	21474.8	19829.7	1645.1
2007	21054.5	1251.2	22305.7	19829.7	2476.0
2008	21896.7	1301.2	23197.9	19829.7	3368.2
2009	22772.6	1353.3	24125.9	19829.7	4296.2
2010	23683.5	1407.4	25090.9	19829.7	5261.2
2011	24630.8	1463.7	26094.5	19829.7	6264.8
2012	25616.1	1522.3	27138.4	19829.7	7308.7
2013	26640.7	1583.2	28223.9	19829.7	8394.2
2014	27706.3	1646.5	29352.8	19829.7	9523.1
2015	28814.6	1712.3	30526.9	19829.7	10697.6

Table 3.3 reveals that total demand for banana will grow from 20,622.9 tonnes (19,466.1 tonnes for local consumption and 1,156.8 tonnes for export) in the year 2005 to 25,090.9 tonnes by the year 2010. Similarly, the unsatisfied demand will grow from 793.2 tonnes in the year 2005 to 5,261.2 tonnes by the year 2010. Hence, this shows that there is a wide market potential both in the domestic as well as international market.

3. Pricing and Distribution

Current average farm gate price of banana in the country is about Birr 650 per tonne. This price is adopted for sales forecast of the project. The farm is recommended to use the existing fruits and vegetables distributing enterprises.

B FARM CAPACITY AND FARMING PROGRAMME

1. Farm Capacity

The banana plantation farm will have 143 ha.of net irrigable land to be cultivated under different varieties of banana. The total production per annum is expected to be about 5,000 tonnes.

2. Farming Programme

The envisaged banana farm will begin with 70 per cent capacity in the year 2007 production season. The area will grow to 85 per cent and 100 per cent in the second, third production seasons, respectively.

IV. FARMING MATERIALS, AGRICULTRUAL INPUTS AND UTILITIES

A. FARMING MATERIALS AND AGRICULTURAL INPUTS

Seedlings of different varieties of banana, fertilizers, chemicals, wooden poles, hand tools, office furniture, etc. are among the major farm materials and agricultural inputs required for the intended farm.

The agricultural materials and inputs required along with corresponding costs are depicted in Table 4.1. As can be seen from the table, the total costs of farm materials and agricultural inputs are estimated at Birr 1.4 million, of which Birr 1.36 million is required in local currency and Birr 57 thousand in foreign currency.

Table 4.1

FARM MATERIALS AND AGRICULTURAL INPUTS REQUIREMENT AND COST

Sr. No.	Description	Qty (000)	Cost In Birr (000)		
			Local	Foreign	Total
1	Seedlings (No.)	229	1140	-	1140
2	Fertilizer (qt.)	0.43	129	-	129
3	Chemicals (lt.)	-	57	57	114
4	Wooden poles	-	40	-	40
5	Others	-	1.43	-	1.43
	Grand Total		**1,367.43**	**57**	**1424.43**

B. UTILITIES

Fuel /lubricants, electricity, water, office supplies and telephone are the major utilities required for the envisaged project. The requirement of utilities and corresponding cost is shown in Table 4.2. As can be seen from the table, the overall cost for utilities is estimated to be Birr 816,000.

Table 4.2

UTILITIES REQUIREMENT AND COST

Sr. No	Description	Qty. (000)	Total Cost Birr (000)
1	Fuel (lt)	140	352
2	Lubricant (lt/Kg)	18	35
3	Electricity (Kwh)	95	45
4	Water (m^3)	190	375
5	Telephone	-	4
6	Office supplies	-	5
	Grand Total		**816**

V. FARM OPERATION TECHNOLOGY AND ENGINEERING

A. FARMING TECHNOLOGY

1. Farming Process

a) Land Development

The agricultural operation of banana plantation will start with land development. Land development includes surveying, land clearing, land cleaning and irrigation land and access and farm road construction.

b) Land preparation and Planting Wind Breaks

Land development for banana plantation is followed by land preparation. It's operation includes ploughing, disking, harrowing and planting pits digging.

Banana is susceptible to wind damage. Hence, it is highly desirable to plant wind breaks surrounding the plantation blocks. The tall ducasse banana variety is excellent wind break for commercial banana farms .

c) Planting Seedlings.

Before planting appropriate varieties should be selected well ahead of time. The suckers of the selected varieties of banana are planted in pits after pre-irrigation.

d) Weeding, Cultivation and Pest Control

Generally, weeds suppress the growth and reduce the total production by competing for water and nutrient . Hence, banana plants should be protected from weed. Shallow cultivation in young plantation is advisable to control weeds. Pesticides spraying to minimize crop damage by various pests will be carried out by daily labours.

e) Irrigation

Irrigation is compulsory during the dry months of the Years. Sever water stress limits the production and quality of fingers. In hot low land area, irrigating the field in 8-10 days interval is accepted by growers.

f) Fertilization

Heavy applications of organic manures or fertilizers are considered necessary in order to get high yields and to extend the life of banana plantation. DAP and Urea are the two most important inorganic fertilizers which are commonly used in banana production.

g) Management Practices

Desuckering is one of the most important management practice which is carried out to remove unwanted suckers. These suckers have to be removed periodically as they compete with mother plant for nutrients. suckers can be removed by cutting at the ground level.

The removal of withered floral parts of the tip of the fingers is another practice. It is conducted in order to control the fruit tip disease of banana fingers and to increase the attractiveness of the bunches.

h) Harvesting

Harvesting of bunches will be under taken when the fingers get whole but before ripening. The bunches are carefully harvested and fingers are dehanded in cluster in the field. Harvesting will be followed by various post- harvest techniques. This includes transporting, ripening and marketing of the banana product. Transportation means is expected to be tractors driven trailers and trucks.

2. Sources Of Technology.

The farm machinery and equipment required for conducting the envisaged farm could be supplied by Ries Engineering, Nazareth Tractor Assembly Plant, Tetraco Plc. where as planting materials, fertilizers, chemicals and small hand tools could be supplied by a number of governmental and non - governmental organizations.

B. ENGINEERING

1. Farm Machinery And Equipment

The farm machinery and equipment and the corresponding costs required are give in Table 5.1. As can be seen from Table 5.1, the total cost for farm machinery and equipment will be about Birr 1.226 million , out of which Birr 130 thousand (10.6%) is in local currency and Birr 1.1 million(89.4%) is in foreign currency.

Table 5.1

FARM MACHINERY AND EQUIPMENT REQUIREMENT AND COST

Sr. No.	Description	Qty.	Cost Birr (000)		
			Local	Foreign	Total
1.	Tractor 110 Hp-125 Hp	1	-	250	250
2.	Disk Plough	1	-	50	50
3.	Disc Harrow of set Type	1	-	80	80
4.	Trailers	1	80	-	80
5.	Sprayers (manual)	60	-	6	6
6.	Generator	1	20	100	120
7.	Workshop equipment (set)	1	-	40	40
8.	Tools (set)	1	-	20	20
9.	Truck/medium	1	-	400	400
10.	Vehicle	1	-	150	150
11.	Hand tools/implements		20	-	20
12.	Office equipment	-	10	-	10
	Grand Total		**130**	**1,096**	**1,226**

2. Land, Building And Civil Works

In general terms, land development cost for 143 ha of irrigated farm and irrigation infrastructure construction is estimated to be Birr 366 thousand and cost for access roads construction in the farm compound will be Birr 171 thousand.

The total area for banana plantation farm including open area for future expansion and recreation places, stores, offices, canteens, workshop, etc is estimated to be 200 ha. The building area of the farm is estimated to be 1000 m^2 and the total cost of the buildings at the rate of Birr 700 m^2 square is expected to be Birr 0.7 million. Rural land lease rate in BGRS ranges from Birr 15 to Birr 30 per hectare, accordingly, taking the maximum lease rate the total cost of land lease for 70 years of land holding is estimated at Birr 0.42 million. In this profile it is assumed that the total land lease cost is paid in advance.

3. Proposed Location

The location of the farm is proposed to be in Asosa zone or Metekel zone where water and land are found abundantly and the agro-climatic conditions are expected to be suitable for banana production.

VI. MANPOWER AND TRANINING REQUIREMENT

A. MANPOWER REQUIREMENT

The permanent manpower requirement of the envisaged farm is 17 persons. The status of manpower (permanent and casual labour) required for the project and the corresponding costs are given in Table 6.1. The total cost required for permanent and casual labour is estimated at Birr 188.2 thousand and Birr 24.6 thousand, respectively.

Table 6.1

MANPOWER REQUIREMENT AND ANNUAL LABOUL COST

Sr. No.	Description	Req. No.	Monthly Salary (Birr)	Annual Salary (Birr 000)
1.	Farm Manager	1	2250	27
2.	Secretary/ Cashier	1	700	8.4
3.	Horticulturist	1	2000	24
4.	Irrigation Engineer	1	2000	24
5.	Accountant	1	700	8.4
6.	Purchase / Sales person	1	800	9.6
7.	Tractor Operator	1	800	9.6
8.	Mechanic	1	500	6.00
9.	Drivers	2	1500	12
10.	Generator Operator	1	300	3.6
11.	Store Person	1	500	6.0
12.	Guards	4	800	9.6
13.	Genitor / Office girl	1	200	2.4
	Sub-total	**17**		**150.6**
	Employee Benefits 25%			37.6
	Total			188.2
	Casual labour			24.6
	Grand Total			**212.8**

B. TRAINING REQUIREMENT

No special training is required for the envisaged banana plantation farm.

VII. FINANCIAL ANALYSIS

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

Construction period	1 years
Source of finance	30 % equity
	70 % loan
Tax holidays	6 years
Bank interest	7.5 %
Discounted cashflow	8.5 %

Repair and maintenance	3 % of the total plant and machinery
Accounts receivable	30 days
Raw material, local	30 days
Raw materials, import	90 days
Work in progress	240 days
Finished products	5 days
Cash in hand	5 days
Accounts payable	30 days

A. TOTAL INITIAL INVESTMENT COST

The total initial investment cost of the project including working capital is estimated at about 4.25 million, of which 28.87 per cent will be required in foreign currency.

The major breakdown of the total initial investment cost is shown in Table 7.1

Table 7.1

INITIAL INVESTMENT COST

Sr. No.	Cost Items	Total ('000 BIRR)
1	Land lease value	420.0
2	Site preparation and development	537.0
3	Building and Civil Work	700.0
4	Farm Machinery and Equipment	1,226.0
5	Office Furniture and Equipment	20
6	Vehicle	550.0
7	Pre-production Expenditure*	251.03
8	Working Capital	546.37
	Total Investment cost	**4,250.39**
	Foreign share	**31.74**

B. PRODUCTION COST

The annual production cost at full operation capacity is estimated at Birr 3.02 million (see Table 7.2). The material and utility cost accounts for 73.55 per cent while repair and maintenance take 1.21 per cent of the production cost.

* *N.B Pre-production expenditure includes interest during construction (Birr 246.03 thousand), (Birr 5 thousand) costs of registration, licensing and formation of the company including legal fees, commissioning expenses, etc.*

Table 7.2

ANNUAL PRODUCTION COST AT FULL CAPACITY ('000 BIRR)

Items	Cost	%
Farming Materials and Inputs	1,424.43	47.0
Utilities	816	26.79
Maintenance and repair	36.78	1.25
Labour direct	175	5.74
Factory overheads *	39.2	1.29
Administration Cost **	15	0.49
Total Operating Costs	**2,506.61**	**82.29**
Depreciation	318.45	10.44
Cost of Finance	203.62	
Total Production Cost	**3,028.68**	**100**

C. FINANCIAL EVALUATION

1. Profitability

According to the projected income statement, the project will start generating profit in the 2nd year of operation. Important ratios such as profit to total sales, net profit to equity (Return on equity) and net profit plus interest on total investment (return on total investment) show an increasing trend during the lifetime of the project.

The income statement and the other indicators of profitability show that the project is viable.

2. Break-even Analysis

The break-even point of the project including cost of finance when it starts to operates at full capacity (year 3) is estimated by using income statement projection.

$$BE = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable cost}} = 45\%$$

* *Factory overhead cost includes salaries and wages of supervisors, insurance of factory workers, social costs on salaries of direct labour, etc.*

** *Administrative cost includes salaries and wages, insurance, social costs, materials and services used by administrative staff etc.*

3. Pay-Back Period

The investment cost and income statement projection are used to project the pay-back period. The project's initial investment will be fully recovered within 6 years.

4. Internal Rate of Return and Net Present Value

Based on the cash flow statement, the calculated IRR of the project is 15% and the net present value at 8.5% discount rate is Birr 1.73 million.

D. ECONOMIC BENEFITS

The project can create employment for 17 persons. In addition to supply of the domestic needs, the project will generate Birr 0.19 million per annum in terms of tax revenue when it starts to operate at full capacity. Moreover, the Regional Government can collect employment, income tax and sales tax revenue. The establishment of such a farm will have a foreign exchange earning effect to the country by boosting the current export level.