15. PROFILE ON CLEAND (CERTIFIED) SEED

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I. SUMMARY

This profile envisages the establishment of a plant for the production of 710 tonnes of cleaned (certified) seed per annum.

The present demand for the proposed product is estimated at 117.4 tonnes per annum and it is projected to reach at 334.8 tonnes by the year 2015.

The plant will create employment opportunities for 22 persons.

The total investment requirement is estimated at Birr 6.06 million, out of which Birr 3 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 1.63 million discounted at 10.5%.

II. PRODUCT DESCRIPTION AND APPLICATION

Seed is a starting material for any type of crop production. As a starting material, it should have high genetic potential for germination and high yielding. In addition, it must be free of insect pests and disease. The other requirement for a high standard quality seed is its freedom against impurities such as weeds, inert matter, dust, broken/shriveled seeds, etc. In order to get high yield per unit area/total production, every season farmers should be supplied with adequate seeds free of insect pests, diseases, weeds and other impurities. To supply farmers every year with sufficient pure seeds, processing should be continuously carried out every year for different classes of seeds. Seed cleaning machines are the appropriate technologies for preparing seeds with optimum requirements. During seed processing the product being cleaned passes through a distribution system, a self-regulating feeding flap, being equipped with weights, and finally reaches the screening drum. Due to the rotary motion, coarse

foreign matters separate from the product, pass a sluice and fall into a wind sifter. There in an intensive air flow takes off dust and specifically light items. Thereafter, the pre-cleaned product is falling into a collection hopper with outlet socket. Within the separating chamber air separates from light particles which are picked up by a screw conveyor and transported to the outlet. Only very light particles such as dust and shells are blown into the cycles and bagged.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

Improved seed is a crop variety which gives a significantly higher yield and better quality as compared to locally produced variety of seeds. The productivity of the agricultural sector of the country has remained very low due to rudimentary farming system and low utilization of modern inputs such as improved seeds.

Small holder farmers traditionally use their own seed throughout the country. However, the use of improved seed is increasing in the past few years due to the expansion of extension packages. Table 3.1 shows the total crop cultivated area and the area and quantity of improved seeds applied by private small holder farmers in Ethiopia.

Table 3.1

TOTAL CROP CULTIVATED AREA, IMPROVED SEED APPLIED AREA AND QUANTITY OF IMPROVED SEED APPLIED

Year	Total Cultivated Area 000 ha.	Improved Seed Applied Area 000 ha.	Quantity of Improved Seed Used, 000 Quintal	%
1997	6,849.50	72.10	104.50	
1998	7,566.96	149.56	105.27	0.74
1999	8,924.25	239.00	138.05	31.14
2000	9,133.64	329.38	166.73	20.77
2001	10,438.8	440.27	206.57	23.90

Source:- *CSA. Agricultural Sample Survey farm Management practices.*

As could be seen from Table 3.1, the quantity of improved seed applied during the period 1997-2001 has been consistently increasing from year to year. The amount of improved seed applied in 1997 was 104.5 thousand quintals. This has increased to 206.57 thousand quintals in the year 2001. This indicates that on the average the use of improved seed has increased by a bout 19% annually.

According to CSA, Agricultural Sample Survey on Farm Management Practices, the BGRS has 179.79 thousand hectares of cultivated land in the year 2000/01. The area upon which improved seed applied is only 4.69 thousand hectares which is only 1.07% of the total cultivated area. The total quantity of seed used was 47.19 thousand quintals, of which the share of improved seed is 0.97 thousand quintals or 2% of the total seed. Compared to the national average, the use of improved seed in BGRS is very low.

In order to determine the present effective demand for improved seed in BGRS, the amount of improved seed applied in 2000/01 has been taken as a starting base. On the other hand, the average growth rate of improved seed used at national level has been considered which was about 19%. Taking the objective condition of the region, i.e, the awareness of the peasant community and the capacity of concerned institutions, an annual average growth rate of 10%

is assumed. Accordingly, the present (2003/04) effective demand for improved seed in BGRS is estimated at 1.174 thousand quintals.

2. Projected Demand

The future demand for improved seed depends on the increase in use of improved seed due to awareness of farmers, availability of improved seed and extension services.

The Ethiopian government has adopted agricultural-led industrialization as central plank of its development programme, with a focus on productivity growth on small farms. Increased agricultural productivity will be achieved primarily through an extensive extension programme. Hence, in view of the above, it would be reasonable to conclude that the future demand for improved seed will show a very fast growth. However, to be on the conservative side, the future demand for improved seed in BGRS is assumed to grow by 10 per cent per annum. Table 3.2 shows the projected demand for improved seed.

Table 3.2

PROJECTED DEMAND FOR IMPROVED SEED

Year	Projected Demand ('000 quintals)
2004	1.174
2005	1.291
2006	1.420
2007	1.562
2008	1.718
2009	1.890
2010	2.079
2011	2.287
2012	2.516
2013	2.767
2014	3.044
2015	3.348

3. Pricing and Distribution

Based on the average prices of the last two years a farm-gate price of Birr 5.5 per kg is recommended.

The envisaged farm is recommended to distribute its products by establishing own distribution stores in major towns. Moreover, it can distribute the product through making arrangements with Farmers Associations and Service Cooperatives that are existing in the region.

B. PLANT CAPACITY AND PRODUCTION PROGRAMME

1. Plant Capacity

The seed processing plant will have a production capacity of 710 tonnes of cleaned seeds per annum based on 180 working days and a single shift of 8 hours per day.

2. Production Programme

Considering the time required to penetrate the market, the plant will presume operation with about 80 per cent, 90 per cent and 100 per cent in the first, second and third years, respectively.

IV. MATERIALS , INPUTS AND UTILITIES

A. MATERIALS AND INPUTS

Seed bags, canvas and chemicals (fumigants) are the main materials and inputs required for seed processing plant. The materials and inputs required along with corresponding cost are described in Table 4.1.

Table 4.1.

ANNUAL RAW MATERIALS AND INPUTS REQUIREMENT AND CORRESPONDING COSTS

Sr. No.	Description	Qty.	Cost (000 Birr)		
			FC	LC	Total
1.	Seed (Tonnes)	800	-	2800	2800
2.	Bags (No.)	32,000	-	64	64
3.	Canvas (LS)	LS	7	-	7
4.	Chemicals (LS)	LS	5	-	5
	Grand Total		**12**	**2864**	**2876**

B. UTILITIES

The utilities required for seed processing plant are electricity and water. The utilities required for the envisaged seed processing plant and their corresponding costs are given in Table 4.2.

Table 4.2

UTILITIES CONSUMPTION AND CORRESPONDING COSTS

Sr. No.	Description	Qty.	Cost in Birr
1	Electricity (kWh)	37,000	18,500
2	Water (m^3)	1250	3,750
	Total		**22,250**

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

The basic improved seed will be procured from Agricultural Research Organization and will be distributed to farmers for cultivation and than the harvest will be purchased by the envisaged project and the seeds will be processed.

The seed processing plant comprises 3 steps *viz* pre-cleaning, seed processing and seed treating series.

Seed collection from known sources and weighing will be the first step in seed processing. The collected seed being cleaned passes through a distribution system, a self regulating, feeding flap, being equipped with weights, and finally reaches the screening drum. Because of the rotary motion, coarse and foreign matters and dusts, including lighter pieces of shells are sorted out. Thereafter the pre cleaned product is falling into a collection hopper with outlet socket. During pre- cleaning three kinds of impurities: coarse, foreign matters and dusts, including higher pieces of shells are sorted out. In the seed processing, drying and cooling will be employed for conservation purposes before storage. Seed drying and cooling will be followed by seed treatment which includes dressing of seeds with powder or liquid against seed born pests. Finally, the seed is bagged with 25 kg capacity and stored in a war house with controlled temperature.

2. Source of Technology

The machinery and equipment required can be supplied by HAGBES Plc., Ries Engineering etc.

B. ENGINEERING

1. Machinery and Equipment

The required plant machinery and equipment with their corresponding costs are given in table 5.1. The total cost is estimated at Birr 3 million, out of which Birr 2.7 million is required in foreign currency.

Table 5.1

LIST OF MACHINERIE AND EQUIPMENTS REQUIRED

Sr. No.	Description	Qty.
1	Multi Clear	LS
	- Separate fan	1
	- Connection spout for air pipe	
	- Interchangeable screens	1
	- Feeding Bin	1
	- Discharge hopper	1
	- Connection spout	1
	- Seed flow device	1
	- Frequency converter	1
2	Weighing/ balance	1
3	Manual Swing machine	1

2. Land, Building and Civil Works

In general terms, the total area required for the seed processing plant is estimated to be 2600 m^2. The land is expected to be utilized for construction of stores, offices, and seed processing units. The area for seed processing unit, warehouse, offices and staff canteen is estimated to

be 600 m^2, 800 m^2 , 120 m^2 , and 80 m^2 , respectively; and the remaining 1000 m^2 will be left open. Cost of construction for seed processing building, at a unit cost of Birr 1,000 per/m^2, is estimated to be Birr 0.6 million and for warehouse and offices and staff canteen, at a unit cost of Birr 700 per m^2, is estimated to be Birr 0.7 million. The total cost of construction is expected to be Birr 1.30 million. The total land lease cost, at the rate of Birr 2 per m^2 and for a period of 70 years, is estimated at Birr 364,000. It is assumed that the total land lease cost will be paid in advance.

3. Proposed Location

The envisaged multi-seed cleaner plant could be located in the major cereal crops producing zones like Assosa and Metekel.

VI. MANPOWER AND TRAINING REQUIREMENT

A. MANPOWER REQUIREMENT

The manpower requirement for the envisaged seed processing plant is shown in Table 6.1. The total number of employees required is 22 persons.

Table 6.1

MANPOWER REQUIREMENT AND LABOUR COST

Sr. No.	Description	Req. No.	Monthly Salary (Birr)	Annual Salary (Birr
1	Plant Manager	1	1000	12000
2	Secretary/Cashier Salesman	1	750	9000
3	Accountant	1	700	8400
4	Store Keeper	1	350	4200
5	Line Operators	3	600	21600
6	Mechanic	1	700	8400
7	Drivers	2	500	12000
8	Ass. Drivers	2	300	7200
9	Labourers (including office boy and janitor	10	300	36000
	Total	**22**		**118800**
	Employees Benefit (25%)			29700
	Grand Total			**148500**

B. TRAINING REQUIREMENT

Training is required for the plant manager and the three line operators. The training will be provided for one month by the multi-seed cleaner supplier at the project site. The total cost for training, which will be paid for the supplier, is estimated to be Birr 25 thousand.

VII. FINANCIAL ANALYSIS

The financial analysis of cleand and certified seed project is based on the data provided in the previous chatpers and the following assumptions:-

Construction period	2 years
Source of finance	30% equity
	70% loan
Tax holidays	3 years
Bank interest	10.5%
Discounted cash flow	10.5%
Repair and maintenance	5 % of Plant machinery and equipment
Accounts receivable	30 days
Raw material (local)	30 days
Raw material (import)	90 days
Work in progress	1 days
Finished products	30 days
Cash at 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 Birr 6.058 million, out of which about 45% will be required in foreign currency. Details are indicated in Table 7.1.

Table 7.1

INITIAL INVESTMENT COST ('000 BIRR)

Sr. No.	Cost Items	Foreign Currency	Local Currency	Total
1	Land	-	364.00	364.00
2	Building and Civil Work	-	1,300.00	1,300.00
3	Plant Machinery and Equipment	2707.00	300.00	3,007.00
4	Office Furniture and Equipment	-	150.00	150.00
5	Vehicle	-	**250**	**250**
6	Pre-production Expenditure*	-	**957.78**	**957.78**
	Total Investment Cost	**2707.00**	**3321.78**	**6028.78**
7	Working Capital	35.172	257.928	293.10
	Grand Total	**2742.172**	**3315.928**	**6,058.09**

B. PRODUCTION COST

The annual production cost at full operation capacity of the plant is estimated at Birr 3.55 million (see Table 7.2). The material and utility cost accounts for 70 per cent while repair and maintenance take 0.63 per cent of the production cost.

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* *Pre-production expenditure include interest during construction (Birr 807,780), training (Birr 25,000) and cost of registration, licensing and formation of the company including legal fees, commissioning expenses, etc.*

Table 7.2

ANNUAL PRODUCTION COST

('000 BIRR)

Items	Year			
	3	**4**	**7**	**10**
Raw Material and Inputs	1900.48	2209.06	2469.00	2469.00
Labour Direct	54.78	63.78	71.28	71.28
Utilities	17.32	20.13	22.50	22.50
Maintenance and repair	86.21	100.21	112.00	112.00
Labour overheads	22.86	26.57	29.70	29.70
Administration Cost	36.58	42.52	47.52	47.52
Total operating costs	**2,118.32**	**2,462.26**	**2,752.00**	**2,752.00**
Depreciation	465.90	465.90	465.90	385.90
Cost of Finance	468.56	439.86	334.37	192.04
Total Production Cost	**3,052.78**	**3,368.02**	**3,552.27**	**3,329.94**

C. FINANCIAL EVALUATION

1. Profitability

According to the projected income statement, the project will start generating profit in the second year of operation. Important ratios such as the percentage of net profit to total sales, net profit to equity (return on equity) and net profit plus interest to total investment (return on total investment) will show an increasing trend throughout the production life of the project. The income statement and other profitability indicators show that the project is viable.

2. Break-even Analysis

The break-even point of the project is estimated by using income statement projection.

$$BE = \frac{\text{Fixed Cost}}{\text{Sales-Variable Cost}} = 41\ \%$$

3. Pay-Back Period

The investment cost and income statement projection are used to project the pay-back period, the project will fully recover the initial investment and working capital within 7 years time.

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 10.5% discount rate is Birr 1.63 million.

D. ECONOMIC BENEFITS

The project can create employment opportunities for 22 persons. In addition to supply of the domestic needs, the project will generate Birr 2.73 million in terms of tax revenue. Moreover, the Regional Government can collect employment, income tax and sales tax revenue.