42. MINERAL LICKS

TABLE OF CONTENTS

I. SUMMARY

This profile envisages the establishment of a plant for the production of Mineral Licks with a capacity of 900 tonnes per annum.

The present demand for the proposed product is estimated at 789 tonnes per annum. The demand is expected to reach at 1,183 tonnes by the year 2010.

The plant will create employment opportunities for 35 persons.

The total investment requirement is estimated at Birr 2.7 million, out of which Birr 0.33 million is required for plant and machinery.

The project is financially viable with an internal rate of return (IRR) of 17.4% and a net present value (NPV) of Birr 1.4 million, discounted at 8.5 %.

II. PRODUCT DESCRIPTION AND APPLICATION

Mineral licks are supplementary animal feed components in a cylindrical shaped blocks which are useful to enrich the feed with desirable minerals. The major components of mineral licks are molasses, bone meal, salt, lime and sulfates of copper, zinc, magnesium and cobalt.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Present Supply and Demand

In BGRS, the main source of animal feed is natural grazing land, crop residues and aftermath grazing. Although the amount and quality of feed resources is the determining factors for the condition and productivity of animals, the use of improved feed is virtually negligible in the region. Hence, the production of livestock products such as meat, milk and the like has remained very low.

Mineral licks are concentrated animal feed which contain different minerals/nutrients that are required for healthy growth of animals. Hence, they are supplementary feed in addition to the traditional types of feed.

Currently, there is only one plant in the country, which produces mineral licks. The plant is located at Awash Sebat town in the Afar Regional State. The production capacity of the plant is about 1,000 tonnes per annum. The plant supplies its products to the eastern part of the country and satisfies only a small portion of the total demand.

To determine the present potential demand for mineral licks in BGRS, the livestock population has been taken as a starting base. According to the Resource Potential Assessment study conducted by IPS for BGRS, there are 253,702 cattle, 102,289 sheep and 240,848 goats. The recommended annual consumption of mineral licks is 12.5 kg for cattle and 2.25 kg for sheep and goats.

As per the recommended annual consumption for cattle, sheep and goats the total amount of mineral licks required for the region's livestock population is 3,943 tonnes. Considering conditional limiting factors such as product adaptability, awareness and income of farmers, accessibility of the product to remote villages etc only 20% of the cattle population are assumed to be fed with mineral licks initially. Accordingly, the current demand for mineral licks in the region is estimated at 789 tonnes.

2. Projected Demand

As mentioned above, mineral licks are supplementary animal feed components which are useful to enrich the feed with desirable minerals. The demand for mineral licks is influenced by the size & livestock population, awareness of farmers towards the importance of the product, establishment of modern cattle farms and expansion of roads in the region. As these conditions are believed to be improved in the future, a growth rate of 7% is considered in projecting the demand for mineral licks. Table 3.2 depicts the projected demand for mineral licks in for BGRS for the period 2005 - 2015.

Table 3.1
PROJECTED DEMAND FOR MINERAL LICKS IN BGNRS

Year	Demand (Tonnes)
2004	789
2005	844
2006	903
2007	966
2008	1033
2009	1106
2010	1183
2011	1266
2012	1355
2013	1450
2014	1551
2015	1660

Demand for mineral licks in BGRS will grow from 844 tonnes in year 2005 to 1,183 tonnes by the year 2010. By the year 2015, the demand will grow to 1660 tonnes.

3. Pricing and Distribution

The existing plant at Awash Sebat is currently selling the products at a price of Birr 6.00 per 2.25 kg. The same price is assumed for the product of the envisaged project.

A well-established trade channel does not exist for distributing mineral licks. The existing plant is selling the product directly to end-users.

The envisaged plant can either sell its product directly to end-users (for clients around the location of the plant) or appoint commission agents at strategic location (for Clients which are far from the location of the plant).

In order to create awareness about the presence and usefulness of the mineral licks in livestock development, the plant has to create a link with Bureau of Agriculture.

B. PLANT CAPACITY AND PRODUCTION PROGRAMME

1. Plant Capacity

Based on the market study, the capacity of the envisaged plant is rated at 900 tonnes of mineral licks per annum on the basis of two shifts of 16 hours per day and 300 days per year operation. A cylindrical block of mineral licks in its dried form weighs 2.25 kg on the average and about eight blocks are produced in one batch. The capacity of the plant can be increased after some years provided that the product is reliably promoted in the initial period of production.

2. Production Programme

The plant will attain 80% and 90% of the production capacity in the first and second year, respectively. Full capacity will be reached in the third year and onwards. This assumption is made considering the fact that the manufacturing technology will not take long time to master. The formulated production programme is given in Table 3.3.

Table 3.3
ANNUAL PRODUCTION PROGRAMME

Sr. No.	Description	Year 1	Year 2	Year 3
1	Production, tonnes	720	810	900
2	Capacity utilization	80	90	100

IV. MATERIALS AND INPUTS

A. RAW MATERIALS

The major raw materials required for the production of mineral licks are salt of first, second or third grade, bone meal (milled bone), molasses, lime, copper sulfate, zinc sulfate, magnesium sulfate and cobalt sulfate.

Except sulfates of copper, zinc, magnesium and cobalt, which are to be imported the other raw materials are locally available. Molasses will be supplied from sugar factories at Wonji and Methara or from Fincha Sugar Factory located in the western side of Oromia region. Salt and bone meal can be supplied from the region. Lime can be acquired from Dire Dawa Cement Factory, but in the future it can be produced in the region since there is deposit of calcium carbonate at different areas. The annual requirement of raw materials at full production capacity of the plant and the corresponding estimated costs are shown in Table 4.1.

Table 4.1
RAW MATERIALS REQUIREMENT AND ESTIMATED COSTS

Sr. No.	Description	Qty. (Tonnes)	Cost ('000Birr)		
			FC	LC	TC
1	Salt	500.40	200	250	250,200
2	Bone meal	400.50	450	360	360,450
3	Molasses	50.00	-	3,000	3,000
4	Lime	50.00	-	4,100	41,100
5	Copper sulfate	9.54	244,800	22,130	266,930
6	Zinc sulfate	8.10	49,140	7,965	57,105
7	Magnesium sulfate	4.50	11,160	8,820	19,980
8	Cobalt sulfate	10.00	270	4,914	5,184
	Grand Total		**305,370**	**698,579**	**1,003,949**

B. UTILITIES

Electricity is the major input required by the plant for operating production equipment and lighting. Water is also required in production process, for cleaning purpose and drinking purposes. The annual utilities consumption at full operation capacity (100%) of the envisaged plant and corresponding cost are estimated and presented in Table 4.2.

Table 4.2
UTILITIES REQUIREMENT AND ESTIMATED COSTS (IN BIRR)

Sr. No.	Description	Unit of Measure	Qty.	Cost
1	Electricity	kWh	144,000	68,256
2	Water	m^3	1,800	3,600
	Total			**71,856**

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

Mineral licks production is a simple process which normally involves the following operations:-

- Salt grinding;
- Weighing or ingredients;
- Blending of salt, lime and bone meal in metal plates;
- Mixing of copper sulfate, zinc sulfate, magnesium sulfate and cobalt sulfate with water;
- Blending of the above mixture with molasses in metal plates;
- Mixing of all ingredients in electrically operated mixer;
- Shaping in manually operated forming machine;
- Drying in ambient temperature for about 24 hours; and
- Storing for delivery.

The mineral licks producing plant does not emit any pollutant to the environment.

2. Source of Technology

The machinery could be made available locally from importers or manufacturers like Mesfin Engineering.

B. ENGINEERING

1. Machinery and Equipment

The major machinery and equipment requried are salt grinding machine, weighing scale, mixing machine, and shaping machines operated manually and using electric power. The major machinery and equipment required by the plant and the cost estimates are given in Table 5.1.

Table 5.1
MACHINERY AND EQUIPMETN REQUIREMENT OF MINERAL LICKS PLANT WITH ESTIMATED COSTS

Sr. No.	Description	Qty. (No.)	Cost ('000 Birr)		
			F.C	L.C.	Total
1	Salt grinding machine	1	10,564	3,521	14,085
2	Weighing scale (big and small size)	2	53,994	24,406	78,400
3	Mixing machine	2	168,975	11,715	180,690
4	Shaping machine	4		56,325	56,325
	Grand Total		**233,533**	**95,967**	**339,500**

As shown in Table 5.1, the cost of machinery and equipment is estimated at Birr 339,500, of which Birr 233,533 is required in foreign currency and the balance Birr 95,967 is required in local currency.

In addition, one single cabinet pick-up at estimated cost of Birr 260,000 is required for the project.

2. Land, Building and Civil Works

The production building is a conventional one made up of hollow block walls, corrugated iron sheet roofing and cement screed floor. The total area of land including provision for open space is about 1,350 m^2. The cost of land holding at the land lease rate of Birr 2.00 per m^2 and for 70 years land holding will be Birr 189,000. The required built-up area for housing of machinery and equipment, storage of product and office is 720 m^2, about 45% of which is for production building, 24% for finished products store, 15% for raw materials store and 16% for office.

Assuming the unit cost of Birr 1,400 per m^2, the total building expense is estimated at Birr 1,008,000. Thus, the total cost of land, building and civil works (including site preparation) assuming that the total land lease cost will be paid in advance is estimated at Birr 1,264,500 million.

3. Proposed Location

The mineral licks plant needs to be located in an area with transportation access for molasses from the Methara Sugar Factory and where water is available. The proximity to market is also another factor to be considered. Thus, populated towns like Assosa, Chagni, etc. can be ideal locations of the project.

VI. MANPOWER AND TRAINING REQUIREMENT

A. MANPOWER REQUIREMENT

The total manpower requirement is 35 persons. About 44% of the workers will be engaged in production activity while the remaining will be involved in service giving and administrative works. The list of required manpower and annual labour cost including fringe benefits is given in Table 6.1. Annual expenditure for manpower is estimated at Birr 405,750.

B. TRAINING REQUIREMENT

The two production shift leaders should be given a seven days on-the-job training during commissioning by knowledgeable technical personnel of the machinery supplier. Cost of training, at a rate of about 120 USD per day per trainee, is estimated at Birr 14,280.

Table 6.1
MANPOWER REQUIREMENT AND ANNUAL LABOUR COST

Sr. No.	Description	No. of Persons	Monthly Salary (Birr)	Annual Salary (Birr)
1	Plant Manager	1	1,800	21,600
2	Executive Secretary	1	800	9,600
3	Production and Technical Department Head	1	1500	18,000
4	Secretary	1	500	6,000
5	Finance and Administration Dept. Head	1	1500	18,000
6	Commercial Dept. Head	1	1500	18,000
7	Production Shift Leader	2	1300	31,200
8	Operator	8	600	57,600
9	General Cleaning Workers	4	350	16,800
10	Shift Mechanic	2	900	21,600
11	Shift Electrician	2	900	21,600
12	Personnel	1	1200	14,400
13	Time Keeper	2	550	13,200
14	Guard	3	300	10,800
15	Accountant	1	1200	14,400
16	Cashier	1	850	10,200
17	Store keeper	1	600	7,200
18	Purchaser	1	850	10,200
19	Driver	1	350	4,200
	Sub-Total	**35**		**324,600**
	Employees' Benefit (25% B. salary)	-		81,150
	Grand Total	**-**		**405,750**

VII. FINANCIAL ANALYSIS

The financial analysis of the Mineral Licks 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	3 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	5 days
Finished products	30 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 2.7 million, of which 11.4 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	189
2.	Building and Civil Work	1008
3.	Plant Machinery and Equipment	339.5
4.	Office Furniture and Equipment	30.0
5.	Vehicle	260.0
6.	Pre-production Expenditure*	184.1
7	Working Capital	715.8
	Total Investment cost	**2,716.4**
	Foreign share	**11.4%**

** N.B Pre-production expenditure includes interest during construction (Birr144 thousand), training (Birr 14 thousand), and (Birr 26 thousand) costs of registration, licensing and formation of the company including legal fees, commissioning expenses, etc.*

B. PRODUCTION COST

The annual production cost at full operation capacity of the plant is estimated at Birr 1.8 million (see Table 7.2). The material and utility cost accounts for 59 per cent while depreciation and financial costs take 16 per cent of the production cost.

Table 7.2
ANNUAL PRODUCTION COST AT FULL CAPACITY ('000 BIRR)

Item	Cost	%
Raw Material and Inputs	1,004	55.1
Utilities	71.9	3.9
Maintenance and repair	19.2	1.1
Labour direct	324.6	17.8
Factory overheads *	81.2	4.5
Administration Cost **	30.0	1.6
Total Operating Costs	**1,530.8**	**84.0**
Depreciation	155.8	8.5
Cost of Finance	136.1	7.5
Total Production Cost	**1,822.1**	**100**

C. FINANCIAL EVALUATION

1. Profitability

According to the projected income statement, the project will start generating profit in the first 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.

$$BE = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable cost}} = 59.6\ \%$$

** 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 17.4 % and the net present value at 8.5% discount rate is Birr 1.4 million.

D. ECONOMIC BENEFITS

The project can create employment for 35 persons. In addition to supply of the domestic needs, the project will generate Birr 63 thousand 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.