40. POULTRY FEED

TABLE OF CONTENTS

		PAGE
I.	SUMMARY	40-3
II.	PRODUCT DESCRIPTION & APPLICATION	40-3
III.	MARKET STUDY AND PLANT CAPACITY	40-3
	A. MARKET STUDY	40-3
	B. PLANT CAPACITY & PRODUCTION PROGRAMME	40-5
IV.	RAW MATERIALS AND INPUTS	40-5
	A. RAW MATERIALS	40-5
	B. UTILITIES	40-6
V.	TECHNOLOGY & ENGINEERING	40-7
	A. TECHNOLOGY	40-7
	B. ENGINEERING	40-7
VI.	MANPOWER & TRAINING REQUIREMENT	40-8
	A. MANPOWER REQUIREMENT	40-8
	B. TRAINING REQUIREMENT	40-9
VII.	FINANCIAL ANLYSIS	40-9
	A. TOTAL INITIAL INVESTMENT COST	40-10
	B. PRODUCTION COST	40-10
	C. FINANCIAL EVALUATION	40-11
	D. ECONOMIC BENEFITS	40-12

I. SUMMARY

This profile envisages the establishment of a poultry feed plant for with a capacity of 360 tonnes per annum.

The present demand for the proposed product is estimated at 300 tonnes per annum. The demand is expected to reach at 430 tonnes by the year 2010.

The plant will create employment opportunities for 40 persons.

The total investment requirement is estimated at Birr 1.5 million, out of which Birr 0.22 million is required for plant and machinery.

The project is financially viable with an internal rate of return (IRR) of 12.5% and a net present value (NPV) of Birr 0.35 million, discounted at 8.5 %.

II. PRODUCT DESCRIPTION AND APPLICATION

Poultry feed is a kind of livestock feed used for feeding the commercially important and other types of domesticated birds such as chickens, turkeys, ducks, geese, etc. that serve as a source of eggs or meat. Poultry feed can be prepared from raw and auxiliary materials like oil cake, wheat bran, molasses, maize, barley, salt, vitamins and minerals, bone-meal, etc..

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply And Present Demand

In BGRS, poultry rearing is of a special value in each family. According to the Resource Assessment of the BGRS conducted by IPS, one of the major problems encountered in livestock production (including poultry) is the huge shortage of feed. As a result, poultry rearing is known by low level of production in terms of eggs and meat yield.

Currently, assorted poultry feed supply is limited in and around Addis Ababa and some big towns of the country. Hence, the production of assorted poultry feed in BGRS would not only address current problems of feed shortage but could also encourage more poultry raising activities.

Poultry population in BGRS is higher than any category of the livestock population. According to the Resource Potential Assessment Study made for the region, the poultry population in 2003 was 505,411. However, current management of poultry birds in the region is backward. Hence, it is necessary to supply assorted feed to expand poultry farming and productivity and thereby increase the income of the farmers.

According to experts estimate, annual consumption of assorted feed per bird is about 3 kgs. Hence, if the total poultry populations are to be fed with assorted feed, annual requirement for the region would be 1,516 tonnes. However, since there are various factors which limit the marketability of the product such as awareness of farmers, accessibility of the product to remote villages, etc., only 20% of the region's poultry population are assumed to be fed with assorted poultry feed, initially. Accordingly, the current demand is estimated at 303 tonnes.

2. Projected Demand

The demand for poultry feed is mainly influenced by the awareness of farmers on the importance of the product, size of poultry population and development of modern poultry farms. By considering the extension programmes to be undertaken by the Bureau of Agriculture and other NGOs, an annual growth rate of 6% is applied in projecting the demand. Table 3.1 depicts the projected demand for poultry feed in BGRS.

Table 3.1
PROJECTED DEMAND FOR POULTRY FEED TONNES)

Year	Projected Demand
2005	321
2006	340
2007	361
2008	382
2009	405
2010	430
2011	455
2012	483
2013	512
2014	542
2015	575

3. Pricing and Distribution

Prices of poultry feed depends upon the composition of the mix and the nutrients. For the purpose of this project, Birr 1,500/tonne is taken as an ex-factory price.

Current practice of poultry feed distribution involves sales at factory-gate and to supply to major towns by opening sales store. The project can use both distribution mechanisms to expand its market outlet.

B. PLANT CAPACITY AND PRODUCTION PROGRAMME

1. Plant Capacity

Based on the outcome of the market assessment, a plant with annual production capacity of 360 tonnes of poultry feed is envisaged in this study. The plant will operate 3 shifts of 8 hours each per day and 300 days per year.

2. Production Programme

The plant will start operation with 90% of its rated annual capacity in the first year and it will grow to 95% in the second year. The proposed production programme is given in Table 3.2. Full production (100%) capacity will be achieved in the third year and thenafter.

Table 3.2
ANNUAL PRODUCTION PROGRAMME

Sr. No.	Description	Year 1	Year 2	Year 3 & thenafter
1	Production, tons	324	342	360
2	Capacity utilization rate, %	90	95	100

IV. MATERIALS AND INPUTS

A. RAW MATERIALS

The basic raw materials required for poultry feed production include: oil cake, cereals like maize, barley, etc. wheat bran, salt, bone- meal, vitamins and minerals. Besides, the major raw materials, poultry feed preparation requires auxiliary materials such as sacks, twine rope and others.

The annual materials requirement at full operation capacity of the plant and their respective cost estimates are presented in Table 4.1.

Table 4.1
ANNUAL RAW AND AUXILIARY MATERIALS REQUIREMENT AND ESTIMATED COST

Sr. No.	Description	Qty (Tonnes)	Cost ('000 Birr)		
			F.C	L.C	TC
1	Oil cakes	81.22	-	16,244	16,244
2	Wheat bran	144	-	37,440	37,440
3	Molasses	10.66	-	2,132	2,132
4	Maize and other cereals	85.82	-	25,746	25,746
5	Limestone	6.62	-	12,247	12,247
6	Meal (bone, blood)	23.04	-	4,148	4,148
7	Mineral / vitamin	0.86	14,706	1,634	16,340
8	Salt	7.78	-	7,780	7,780
9	Sacks (pc)	5,760	-	14,400	14,400
10	Twine rope	lumpsum	-	750	750
11	Amino acids (0.025 kg/qt)	9	3,159	351	3,510
	Grand Total		**17,865**	**122,872**	**140,737**

B. UTILITIES

The utilities required by the plant consist of electric power, water and fuel oil. The electric power is required to run the production machinery and provide lighting for the plant, while water is required for general purpose and to supply the boiler which produces hot water for warming the molasses. Fuel oil is required to operate the hot water boiler. The annual utility consumption at full operation capacity of the plant and the estimated costs are given in Table 4.2.

Table 4.2
ANNUAL UTILITIES REQUIREMENT AND ESTIMATED COSTS

Sr. No.	Description	Unit of Measure	Annual Requirement	Cost (Birr)
1	Electric power	kWh	7,000	2,345
2	Water	m^3	300	600
3	Fuel Oil	lt	18,720	43,056
	Total			**46,001**

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

The major operations involved in the production of poultry feed are raw materials preparation, primary crushing, assorting and measuring, mixing of molasses and other ingredients, fine crushing, pellet making, and packing.

Raw and auxiliary materials are first charged into silos and tanks where they are made ready for further processing. They are then processed by primary crusher. Crushed materials are further separated by means of sieves, and then stored in assorting tanks according to the kind of raw materials.

In assorting and measuring operation, small amounts of additives are charged into the bins containing different assortments of raw materials. The raw materials stored in the assorting tanks are measured in accordance with their use.

The raw materials are then mixed by means of a mixer. In this process, fatty ingredients are added to the materials in order to raise nutrient value of the feed. The feed obtained from the mix is added to molasses. After the feed is mixed with molasses, it is further crushed by means of the second chamber.

Sometimes second crushing is undesirable and can be avoided. The product is next accommodated in the products tanks, and then weighed and packed.

2. Source of Technology

Poultry feed equipment and technology can be acquired by contacting the commercial attaches of respective embassy of countries like India, China or European countries like Italy, Spain, etc. to Ethiopia. The following firm can also be contacted for equipment acquisition.

WE Internation, Inc.
P.O.Box 97
Syracuse, India 46567
USA
Tel. (574) 457 - 3066
Fax (574) 457 - 8807

B. ENGINEERING

1. Machinery and Equipment

The machinery and equipment required by the poultry feed plant is as listed in Table 5.1. The total cost of these machinery and equipment is estimated at Birr 223,200, out of which about Birr 167,400 will be required in foreign currency.

Besides the plant machinery and equipment, two single cabinet pick-up vehicles at a cost of about Birr 520,000 is required for the project.

Table 5.1
LIST OF MACHINERY AND EQUIPMENT REQUIRED

Sr. No.	Description	Qty (pcs)
1	Tanks and silos for raw and auxiliary materials	3
2	Metal screen and shaker	1
3	Mixer	1
4	Hammer mill (crusher)	1
5	Bladder	1
6	Weighing scale (5 tonnes)	1
7	Bagging equipment	1
8	Dust collector	1
9	Product tank	1
10	Tanks for oil cakes and molasses	3
11	Boiler	1
12	Other accessories, set	1

2. Land Buildings and Civil Works

Total land area required by the plant is 5,000 m^2. Total payment for 70 years land holding, at a lease rate of Birr 2/m^2, is estimated to be Birr 700,000. The total built-up area will be 300 m^2. The total cost of construction including land preparation is estimated at Birr 420,000. Thus, the total investment on land, building and civil

works assuming that the total land lease cost will be paid in advance is estimated at Birr 1.12 million.

3. Proposed Location

Most of the raw materials required by the plant are industrial by-products that are mostly available in urban areas. In addition, poultries which are target market for the poultry feed plant are also mostly located in towns or their suburbs. Therefore, it is advisable to locate the envisaged plant in town of the region like Asossa, Chagni and others where the infrastructure is in place and large market outlet is available.

VI. MANPOWER AND TRAINING REQUIREMENT

A. MANPOWER REQUIREMENT

The total manpower requirement of the envisaged project is 40 persons. The details on manpower requirement and the corresponding annual labour costs are as shown in Table 6.1.

Table 6.1
MANPOWER REQUIREMENT AND ESTIMATED ANNUAL LABOUR COST

Sr. No.	Description	No. of Persons	Salary (Birr)	
			Monthly	Annual
1	General Manager	1	2,000	24,000
2	Secretary	1	600	7,200
3	Finance and Administration Head	1	1,500	18,000
4	Accountant	1	600	7,200
5	Cashier	1	550	6,600
6	Personnel	1	650	7,800
7	Commercial Head	1	1,500	18,000
8	Sales Person	1	550	6,600
9	Purchaser	1	550	6,600
10	Store keeper	1	550	6,000
11	Driver	1	400	4,800
12	Guard	3	450	5,400
13	Production and technic Head	1	1,600	19,200
14	Shift Leader	2	1,400	16,800
15	Mechanic	2	1,200	14,400
16	Electrician	1	600	7,200
17	Operator	10	3,000	36,000
18	Labourer	10	1,500	18,000
	Sub-total	**40**		**230,400**
	Employees' benefit (20% of basic salary)			46,080
	Grand Total	**40**		**276,480**

B. TRAINING REQUIREMENT

Key production personnel like 2 Shift leaders and 12 Operators should be given on-the-job training for three weeks by the advanced technician of the equipment supplier during erection and commissioning. The total cost of such training is estimated at Birr 36,000.

VII. FINANCIAL ANALYSIS

The financial analysis of the Poultry Feed 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 1.5 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	70
2.	Building and Civil Work	420
3.	Plant Machinery and Equipment	223
4.	Office Furniture and Equipment	30
5.	Vehicle	520
6.	Pre-production Expenditure*	120.6
7	Working Capital	118
	Total Investment cost	**1,501.8**
	Foreign share	**11.4**

* *N.B Pre-production expenditure includes interest during construction (Birr 79.6 thousand), training (Birr 36 thousand), and (Birr 5 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 0.7 million (see Table 7.2). The material and utility cost accounts for 25.6 per cent while repair and maintenance take 2.6 per cent of the production cost.

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

Items	Cost	%
Raw Material and Inputs	140.7	19.3
Utilities	46	6.3
Maintenance and repair	19	2.6
Labour direct	230	31.6
Factory overheads *	46	6.3
Administration Cost **	10	1.4
Total Operating Costs	**492**	**67.5**
Depreciation	162	22.2
Cost of Finance	75	10.3
Total Production Cost	**729**	**100**

C. FINANCIAL EVALUATION

1. Profitability

According to the projected income statement, the project will start generating profit in the 5th 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 operates at full capacity (year 6) is estimated by using income statement projection.

$$BE = \frac{\text{Fixed Cost}}{\text{Sales - Variable Cost}} = 47\%$$

**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 7 years.

4. Internal Rate of Return and Net Present Value

Based on the cash flow statement, the calculated IRR of the project is 12.5 % and the net present value at 8.5% discount rate is Birr 0.35 million

D. ECONOMIC BENEFITS

The project can create employment for 40 persons. In addition to supply of the domestic needs, the project will generate Birr 0.1 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.