

**99. PROFILE ON POULTRY BREEDING AND  
MULTIPLICATION CENTER**

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## **I. SUMMARY**

This profile envisages the establishment of a poultry breeding and multiplication center with a capacity of 70,000 cockerels and pullets, 70,000 day old chicks, 60,000 fertile eggs for egg production and 120,000 day old chicks for broiler production per annum.

The present demand for the proposed product is estimated at 1.42 million heads per annum. The demand is expected to reach at 1.99 million heads by the year 2020.

The total investment requirement is estimated at about Birr 10.71 million, out of which Birr 1.72 million is required for machinery and equipment. The center will create employment opportunities for 31 persons.

The project is financially viable with an internal rate of return (IRR) of 21.66 % and a net present value (NPV) of Birr 5.53 million, discounted at 8.5%.

The project will create forward linkage with poultry farms.

## **II. PROJECT DESCRIPTION**

This project is aimed at producing 3 months old Pullets and cockerels, day old chicks for broilers and layers, and fertile eggs for those who own incubators and would like to hatch egg using local chicken. The breeds selected for parent stock could be imported from countries that are known to produce layers and broiler breeding avian stock.

### **III. MARKET STUDY AND PROJECT CAPACITY**

#### **A. MARKET STUDY**

##### **1. Past Supply and Current Demand**

Poultry breeding and multiplication center is a center that selects new and improved types of poultry and conduct insemination by natural or artificial means. The center can supply improved breed of layers and broilers for poultry farms in the city and to the farmers in different areas.

The demand for layers and broilers is met mostly through import. However, import data of Customs Authority do not indicate annually imported quantity. Therefore, in order to estimate demand for the product end use approach is employed.

According to the unpublished data of the City Administration's Urban Agriculture Department, the per capita consumption in Addis Ababa was about 2.5 kg of poultry meat. Accordingly, considering the total population size of Addis Ababa in 2008, which is 3.4 million the total consumption of the product is estimated at 8,500 tones. Assuming that one poultry weights on average 1.5 kg the total demand is estimated at 5,666,667. Moreover, conservatively assuming that about 25% of the demand is supplied by modern poultry farms the corresponding demand for poultry layers and broilers is estimated at 1,416,666.

##### **2. Projected Demand**

The demand for poultry layers and broilers is directly related to poultry meat consumption which is mainly influenced by population growth and income rise. The population grows at an average annual growth rate of 2.9%. Accordingly, the demand for the products is estimated to grow at 2.9% per annum which is equivalent to the population growth. Table 3.1 shows the projected demand for poultry layers and broilers

computed by taking the estimated present demand as a base and applying an average annual growth rate of 2.9%.

**Table 3.4**  
**PROJECTED DEMAND ( PIECES)**

<b>Year</b>	<b>Projected Demand</b>
2009	1,457,750
2010	1,500,025
2011	1,543,525
2012	1,588,288
2013	1,634,348
2014	1,681,744
2015	1,730,515
2016	1,780,700
2017	1,832,340
2018	1,885,478
2019	1,940,157
2020	1,996,421

### **3. Pricing and Distribution**

After considering the current retail price of poultry layers and broilers, a factory-gate price of Birr 20 per head is recommended for the envisaged plant. The product can be distributed directly to end users.

**B. PROJECT CAPACITY AND PRODUCTION PROGRAMME****1. Capacity**

The center is expected to start at full capacity starting the first year by introducing 1,100 broiler and 1,100 layer day old breeding stocks from known producers' world wide. The reason why it is assumed to start at full capacity is because of the existing high demand for poultry in the city.

**2. Production Programme**

The center will introduce 2200 day old meat and egg type chicks and rear them for 5 months as parent stocks. Starting the fifth month the hens will start laying eggs which could be supplied either hatched as day old chicks, or pullets and cockerels or fertile eggs. The chicks that will be supplied in a form of day old or rear pullets and cockerels all they reach 3 months old will be hatched in the center. Thus, the center is expected to supply 70,000 cockerels and pullets, 70,000 day old chicks and 60,000 fertile eggs for egg production similarly 120,000 day old chicks for broiler production are expected to be supplied in one year. The envisaged project starts operating at 75% of its full capacity and grows to 90% and 100% in the second and third year. Production programme of the envisaged project is envisaged in the Table 3.3 below.

**Table 3.3**  
**PRODUCTION PROGRAMME**

Year	Capacity Utilization (%)	Production(no.)			
		Cockerels and Pullets	Day Old Chicks for Egg Production	Fertile Eggs	Day old Chicks for Broiler Production
1	75	52,500	52,500	45,000	90,000
2	90	63,000	63,000	54,000	108,000
3-10	100	70,000	70,000	60,000	120,000

#### **IV. MATERIALS AND INPUTS**

##### **A. RAW MATERIALS**

The raw materials and inputs used in the production of chicks and eggs are poultry breeding stock (parent stock), feed and medicament. The breeding stocks will be imported through importers in Addis Ababa where as the other inputs are available locally.

**Table 4.1**  
**RAW MATERIAL REQUIREMENT & COST**

Sr. No.	Electricity	Qty.	Cost in Birr		
			Foreign	Local	Total
1	Parent stocks (in No)	2,200	374,000	-	374,000
2	Feed (Quintal.)	565	-	1,697,100	1,697,100
3	Medicament				
3.1	Parent stock	2,200	-	33,000	33,000
3.2	For pullets and cockerels	70,000	-	350,000	350,000
	<b>Grand Total</b>		<b>374,000</b>	<b>2,080,100</b>	<b>2,454,100</b>

## B. UTILITIES

The major utilities needed for the operation of the multiplication center are electricity and water. Electric power is required for 365 days to run the incubators and for heating the chicks, for at least 3 weeks. The power to be installed will be 3 phase. The daily requirement is estimated at 240 kw and the total annual requirement will be 87600 kwh. Similarly the plant consumes 300m<sup>3</sup> of water per annum. The annual requirement of utility and the corresponding cost is given in Table 4.2.



**Table 4.2**  
**UTILITIES REQUIREMENT AND COST**

<b>Sr. No.</b>	<b>Utility</b>	<b>Unit of Measure</b>	<b>Qty.</b>	<b>Unit Cost (Birr)</b>	<b>Cost (Birr)</b>
1	Electricity	kWh	87,600	0.4736	41,487
2	Waters	m <sup>3</sup>	300	3.25	975
3	Fuel and lubricant				21922
	<b>Total</b>				<b>64,384</b>

## V. LOCATION, SITE AND ENVIRONMENT

### A. LOCATION & SITE

The location and site that would be selected for poultry multiplication center should be closer to mountains at a far distance from residential areas. The site must be accessible by car all the year through.

In addition to this all the necessary infrastructure like electricity and water should be obtained with little problem.

## VI. TECHNOLOGY AND ENGINEERING

### A. TECHNOLOGY

#### 1. Production Process

First and foremost the parent stocks will be imported at the age of day old. These chicks will be reared by getting electrical heat for 3 weeks. During the 5 months of rearing the

chicks will be fed with feeds that have high protein content so that their growth will be fast. Starting the end of the fifth month the hens will start laying. The eggs will be collected carefully and stored in a cool and dry place. After doing this the average sized eggs will be incubated for 18 days. After the 18<sup>th</sup> day the eggs will be transferred to the hatchery where the hatching process will take place. The baby chicks will be sexed and distributed for customers at their own choice. If they are to be distributed as pullets and cockerels they will be treated to the age of 3 months.

In the modern world, it has been possible to control all problems that are bound to affect any developmental endeavors. With this regard all places in the country are suitable or could be made suitable for poultry production. The enterprise can have an adverse effect on the environment unless mitigating measures are taken. Poultry manure can pollute the environment if proper management practices are utilized.

Because of high Nitrogen content poultry manure is excellent natural fertilizer if, it is composted properly. Besides the composted manure can also be sold and be taken as another source of income.

## **2. Sources of Technology**

Machinery and equipment required can be acquired from Italy, Bulgaria, Brazil, etc through contacts with the commercial attaches of respective embassies to Ethiopia. The following company can be considered as one of the possible source of technology:

Dah Chong Hong (Japan) Ltd.

(K.K. Taisha) Bouekekou (10). 18-2, Roppongi 5-Chome, Minato-Ku, 106-0032

Tel. 03-3582-0706

Fax. 03-3586-8393 03-3582-7148.

**B. ENGINEERING****1. Machinery And Equipment**

The list of machinery and equipment required by the project is shown in Table 6.1. The total cost of the machinery and equipment is estimated at Birr 1.72 million.

**Table 6.1****MACHINERY AND EQUIPMENT REQUIREMENT & COST**

<b>Sr.No</b>	<b>Description</b>	<b>Qty (Nos)</b>	<b>Total Price</b>
1	Incubator	1	500,000
2	Generator	1	100,000
3	Automatic water drinker	115	2300
4	Feeder (suspended)	230	12,650
5	Egg Tray (plastic)	3200	48,000
6	Egg Tray crate	10	2,200
7	Be baker	1	11,000
8	Hover with resistor	15	33,000
9	Egg room cooler	1	205,000
10	Coop	100	165,000
11	Chick Guard	50	600,000
12	Laying Nest	40	15,000
13	Egg displaying shelf	3	19,500
14	Candler	1	1,200
15	Egg selecting	1	3,500
16	Fumigation box	1	3000
17	Wheel barrow	10	2,250
18	Spade	10	200
19	Hoe	10	200
20	Hose (1")	200	400
21	Scale (5kg)	1	500
	<b>Total</b>		<b>1,724,900</b>

## **2. Land, Building and Civil Works**

The total area of land required for the plant is about 5,500 square meters. The total built-up area will be 3,500 square meters and the estimated cost of building, at the rate of Birr 1,800 per m<sup>2</sup>, will amount to Birr 6.3 million. The rearing buildings covers the 3,000 m<sup>2</sup> area, the store 350m<sup>2</sup> and the office building 150 m<sup>2</sup>.

According to the Federal Legislation on the Lease Holding of Urban Land (Proclamation No. 272/2002) in principle, urban land permit by lease is on auction or negotiation basis, however, the time and condition of applying the proclamation shall be determined by the concerned regional or city government depending on the level of development.

In Addis Ababa the City's Land Administration and Development Authority is directly responsible in dealing with matters concerning land. Regarding the manufacturing sector, industrial zone preparation is one of the strategic intervention measures adopted by the City Administration for the promotion of the sector and all manufacturing projects are assumed to be located in the developed industrial zones.

However, the project under consideration is an urban agriculture project. Therefore, it is assumed that the project will be located outside the industrial zones. Accordingly, the initial land lease rate in Addis Ababa set by the City's Land Administration and Development Authority based on the location of land is as shown in Table 6.1.

**Table 6.1**  
**INITIAL LAND LEASE RATE IN ADDIS ABABA**

<b>Sr. No.</b>	<b>Location of the land</b>	<b>Land Grade</b>	<b>Initial Price in m<sup>2</sup></b>
1	Central Business zones	1	1167.3
		2	1062.9
		3	916.2
		4	751.5
		5	619.2
2	Places That are Under Transit	1	716.4
		2	647.1
		3	559.8
		4	472.5
		5	384.3
3	Expansion Zones	1	245.7
		2	207
		3	150.3
		4	132.3

*Source: Addis Ababa City Land Administration Authority.*

As can be seen from Table 6.1, the initial land lease rate ranges from Birr 1,167.3 to Birr 132.3 per m<sup>2</sup>.

Considering the nature of the project, the expansion zones of the City are recommended as the best locations. Moreover, as the project have to be located away from residential houses the lowest land lease rates in the expansion zones of the city which is Birr 132.3/ m<sup>2</sup> is adopted.

The Federal Legislation on the Lease Holding of Urban Land legislation has also set the maximum on lease period and the payment of lease prices (see Table 6.2 and Table 6.3.)

**Table 6.2**  
**LEASE PERIOD**

<b>Type of Service</b>	<b>Lease Period ( Years)</b>
Residential area	99
Industry	80
Education, cultural research health, sport, NGO and religious	99
Trade	70
Urban Agriculture	15
Other service	70

**Table 6.3**  
**LEASE PAYMENT PERIOD**

<b>Sr. No.</b>	<b>Service Type</b>	<b>Period of Payment According to the Grade of Towns</b>
1	Private residential are obtained through tender or negotiation	50 - 60 years
2	Trade	40 - 50 years
3	Industry	40 - 50 years
4	Real estate	40 -50 years
5	Urban Agriculture	8 - 10 years
6	Trade and social service	40 - 50 years
7	Others	40 – 50 years

Moreover, advance payment of lease based on the type of investment ranges from 5% to 10%. For those that pay the entire amount of the lease will receive 0.5% discount from the total lease value and those that pay in installments will be charged interest based on the prevailing interest rate of banks. Moreover, based on the type of investment, two to seven years grace period shall also be provided. The lease price is payable after the grace period annually.

Regarding, the terms and conditions of land lease the Addis Ababa City Government have adopted Article 6 of the Federal Legislation with very minimal changes. Therefore, for the purpose of this project profile since the project is urban agriculture , 15 years lease period, 10 years lease payment completion period, 10% down payment and two years grace period is used.

Accordingly, the land lease cost of the project, at rate of Birr 132.3 m<sup>2</sup> for 15 years of holding is estimated at Birr 10.91 million. Assuming 10% of the total cost ( Birr 1,091,475 ) will be paid in advance as down payment and the remaining Birr 9.82 million will be paid in equal installments with in 10 years, the annual lease payment is estimated at Birr 982,328.

## **VII. MANPOWER AND TRAINING REQUIREMENT**

### **A. MANPOWER REQUIREMENT**

Since the center operates all the year through, some of the workers that are working in the chicks growing room and layers room are expected to work day and night on shift basis. In addition to this the assistant veterinarians will also work at a shift. However the other staff will work 6 days in a week. Based on this assumption the total manpower required at labour cost is shown in Table 7.1.

**Table 7.1**  
**MANPOWER REQUIREMENT & LABOUR COST (BIRR)**

Sr. No.	Description	Req. No.	Salary	
			Monthly	Annual
1	General manager	1	3,000	36,000
2	Production manger	1	2,500	30,000
3	Hatchery expert	1	1,500	18,000
4	Hatchery unit workers	4	2,400	28,800
5	Parent stock growers and chick	20	10,000	120,000
6	Janitors	2	800	9,600
7	Guards	2	800	9,600
	<b>Sub Total</b>	<b>31</b>		<b>252,000</b>
	Employees benefit(25% of basic salary)			63,000
	<b>Total</b>			<b>315,000</b>

## **B. TRAINING REQUIREMENT**

Since strict bio-security measures are to be taken all the attendants will be highlighted on what bio security is all about for one week by the manager and the assistant veterinarians.

## **VIII. FINANCIAL ANALYSIS**

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

Construction period	1 year
Source of finance	30 % equity
	70 % loan



Tax holidays	3 years
Bank interest	8.5%
Discount cash flow	8.5%
Accounts receivable	30 days
Raw material local	30 days
Work in progress	15 days
Finished products	2 days
Cash in hand	5 days
Accounts payable	30 days
Repair and maintenance	5% of machinery cost

#### A. TOTAL INITIAL INVESTMENT COST

The total investment cost of the project including working capital is estimated at Birr 10.71 million. The major breakdown of the total initial investment cost is shown in Table 7.1.

**Table 7.1**  
**INITIAL INVESTMENT COST ( '000 Birr)**

Sr. No.	Cost Items	Local Cost	Foreign Cost	Total Cost
1	Land lease value	1,091.47	-	1,091.47
2	Building and Civil Work	6,300.00	-	6,300.00
3	Plant Machinery and Equipment	1,724.9	-	1,724.90
4	Office Furniture and Equipment	75.00	-	75.00
5	Vehicle	450.00	-	450.00
6	Pre-production Expenditure*	637.38	-	637.38
7	Working Capital	429.67	-	429.67
	<b>Total Investment cost</b>	<b>10,708.42</b>	<b>-</b>	<b>10,708.42</b>

\* *N.B Pre-production expenditure includes interest during construction ( Birr 562.38 thousand, and Birr 75 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 is estimated at Birr 4.95 million (see Table 7.2). The raw material cost accounts for 49.57 per cent of the production cost. The other major components of the production cost are land lease, depreciation and financial cost which account for 19.84%, 12.12% and 9.06% respectively. The remaining 9.41% is the share of utility, repair, maintenance, direct labour and other administration cost.

**Table 7.2**

**ANNUAL PRODUCTION COST AT FULL CAPACITY ('000 BIRR)**

<b>Items</b>	<b>Cost</b>	<b>%</b>
Raw Material and Inputs	2,454.10	49.57
Utilities	64.38	1.30
Maintenance and repair	86.25	1.74
Labour direct	151.20	3.05
Labour overheads	63.00	1.27
Administration Costs	100.80	2.04
Land lease cost	982.33	19.84
<b>Total Operating Costs</b>	<b>3,902.06</b>	<b>78.82</b>
Depreciation	599.99	12.12
Cost of Finance	448.66	9.06
<b>Total Production Cost</b>	<b>4,950.71</b>	<b>100</b>

## C. FINANCIAL EVALUATION

### 1. Profitability

Based on the projected profit and loss statement, the project will generate a profit throughout its operation life. Annual net profit after tax will grow from Birr 1.41 million to Birr 1.37 million during the life of the project. Moreover, at the end of the project life the accumulated cash flow amounts to Birr 16.52 million.

### 2. Ratios

In financial analysis financial ratios and efficiency ratios are used as an index or yardstick for evaluating the financial position of a firm. It is also an indicator for the strength and weakness of the firm or a project. Using the year-end balance sheet figures and other relevant data, the most important ratios such as return on sales which is computed by dividing net income by revenue, return on assets (operating income divided by assets), return on equity (net profit divided by equity) and return on total investment (net profit plus interest divided by total investment) has been carried out over the period of the project life and all the results are found to be satisfactory.

### 3. Break-even Analysis

The break-even analysis establishes a relationship between operation costs and revenues. It indicates the level at which costs and revenue are in equilibrium. To this end, the break-even point of the project including cost of finance when it starts to operate at full capacity (year 3) is estimated by using income statement projection.

$$\text{BE} = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable Cost}} = 24 \%$$

#### **4. Payback Period**

The pay back period, also called pay – off period is defined as the period required to recover the original investment outlay through the accumulated net cash flows earned by the project. Accordingly, based on the projected cash flow it is estimated that the project's initial investment will be fully recovered within 5 years.

#### **5. Internal Rate of Return**

The internal rate of return (IRR) is the annualized effective compounded return rate that can be earned on the invested capital, i.e., the yield on the investment. Put another way, the internal rate of return for an investment is the discount rate that makes the net present value of the investment's income stream total to zero. It is an indicator of the efficiency or quality of an investment. A project is a good investment proposition if its IRR is greater than the rate of return that could be earned by alternate investments or putting the money in a bank account. Accordingly, the IRR of this project is computed to be 21.66 % indicating the viability of the project.

#### **6. Net Present Value**

Net present value (NPV) is defined as the total present ( discounted) value of a time series of cash flows. NPV aggregates cash flows that occur during different periods of time during the life of a project in to a common measuring unit i.e. present value. It is a standard method for using the time value of money to appraise long-term projects. NPV is an indicator of how much value an investment or project adds to the capital invested. In principal a project is accepted if the NPV is non-negative.

Accordingly, the net present value of the project at 8.5% discount rate is found to be Birr 5.53 million which is acceptable.

**D. ECONOMIC BENEFITS**

The project can create employment for 31 persons. In addition to supply of the domestic needs, the project will generate Birr 3.67 million in terms of tax revenue. The project will create forward linkage with poultry farms.