PROFILE ON POULTRY FARM

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I. SUMMARY

This profile envisages the establishment of a farm for the rearing of poultry with raising capacity of 200,000 heads of poultry per annum. Poultry meat and eggs have become the most important sources of protein in the human diet by using it directly or after passing through food processing industries.

The major inputs and auxiliary raw materials required are day old chickens, commercial formula feed, and high quality vaccines which have to be imported.

The present unsatisfied demand for poultry meat and eggs in Addis Ababa is estimated at 7,750 tonnes and 5,410 tones respectively. The demand is expected to reach at 7,845 tonnes and 11,238 tonnes for eggs and poultry meat respectively by the year 2020.

The total investment requirement is estimated at Birr 12.84 million, out of which Birr 3.67 million is required for plant and machinery. The plant will create employment opportunities for 27 persons.

The project is financially viable with an internal rate of return (IRR) of 17.63 % and a net present value (NPV) of Birr 5.59 million, discounted at 8.5 %.

The poultry farm has a backward linkage effect on animal feed processing industries and a forward linkage effect on food processing industries. There is also a substantial export potential.

II. FARM DESCRIPTION AND APPLICATION

Poultry are large domestic fowl (e.g. hens, ducks, geese, turkey) reared for meat or egg. The consumption of poultry has increased considerably owing to the speed at which fowl mature and to the small amount of feed required per kg of meat produced. The production cycle for the envisaged poultry farm starts with day old chicken. Day old chicken is bought for rearing in the envisaged plant by feeding well balanced feed in disease controlled and hygienic shed for about six month and then marketed at this stage.

The major consumers of the product of the envisaged plant will be hotels, restaurants, supermarkets, various institutions with food catering services, and households.

III. MARKET STUDY AND FARM CAPACITY

A. MARKET STUDY

1. Past Supply and Current Demand

Poultry products such as egg and poultry meat are the central diets of Ethiopian's. "Doro *Wet"* which is prepared from poultry meat and eggs is one of the favorite dish of the local population which is prepared especially during religious festivals and holidays, virtually in every household in the country. Moreover, eggs as they are easy to prepare and digest, have good test and nutrient are becoming the favored breakfast items in urban areas like Addis Ababa. Accordingly, due to the traditional consumption habit and as the awareness of the population on the nutritional and other advantages of poultry products increases the market for the products is also expected to expand.

Most of the chickens and egg that are supplied to the City Administration's market come from other regional states and, according to the study made by Livestock Marketing Authority in 2004, the number of eggs and chicken that entered the city was estimated to be 56 million, and 2.1 million, respectively.

According to the unpublished data of the City Administration's uUrban Agriculture Department (2005), the per capita consumption in Addis Ababa was about 2.28 kg of eggs and 2.5 kg of poultry meat. Accordingly, considering the total population size of Addis Ababa in 2008 the total consumption of the products is give in Table 3.1.

Table 3.1

TOTAL EGG AND POULTRY MEAT CONSUMPTION OF ADDIS ABABA (2008)

Egg consumption per person (kg)	2.28
Population size (head)	3,400,000
Total consumption (Kg)	7,752,000
Poultry meat consumption per person (kg)	2.5
Population size (head)	3,400,000
Total Consumption(kg)	8,500,000

As can be seen from Table 3.1, the total current consumption of egg and poultry meat in Addis Ababa is 7,752 tonnes for egg and 8,500 tonnes for poultry meat.

It is estimated that the poultry population in the Addis Ababa is about 350,000 where most of the chicken are raised on small scale level in the backyards. The poultry population is insignificant as compared to the national poultry population, which is estimated at about 63 million. The existing chicken's population in the City are estimated to produce about 2,342 tonnes of egg and 705 tonnes of poultry meat.

The present unsatisfied demand for poultry meat and eggs in Addis Ababa is estimated at 7,750 tones and 5,410 tonnes, respectively.

2. Projected Demand

The demand for poultry meat is mainly influenced by population growth and income rise. The 1961, 1967 and 1978 population sample survey for Addis Ababa revealed that the population of Addis Ababa was 0.4, 0.7 and 1.2 million, respectively. The 1984 census put the population of Addis Ababa at 1.4 million while the 1994 census recorded 2, 112.737 people. There is an increase of 0.7 million or 50 % increase over a decade period. The annual increase over the period 1984-1994 is 5 %. The total population of Addis Ababa in 2007 is estimated to be about 3.4. The population grows at an average annual growth rate of 2.9%. The city population is estimated to reach 4.4 million in year 2015. Accordingly, the rapidly increasing population of the city will augment the demand for poultry products such as egg and poultry meat.

With increasing income or purchasing power, people demand more diversified food products like poultry products. Therefore, the level of poultry products consumption has a strong association with the growth of income.

One of the indicators that measure the economic performance of a country and the well being of the population is GDP. During the period 1995-2005 real GDP growth averaged 5.8% a year, export grew by about 5% a year, annual inflation averaged about 4% and in year 2005 investment had risen to 16% of GDP. The positive performance of the Ethiopian economy is expected to continue in the future. As a result, the market for poultry products may also be expected to increase as economic expansion lead to a raise in the income level of the population.

Accordingly, the demand for the products is estimated to grow at 2.9% per annum which is equivalent to the population growth. Table 3.4 shows the projected demand for eggs and poultry meat in Addis Ababa 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 (IN TONNES)

Year	Projected Demand	
	Eggs	Poultry Meat
2008	5,567	7,975
2009	5,728	8,206
2010	5,894	8,444
2011	6,065	8,689
2012	6,241	8,941
2013	6,422	9,200
2014	6,609	9,467
2015	6,800	9,741
2016	6,997	10,024
2017	7,200	10,315
2018	7,409	10,614
2019	7,624	10,922
2020	7,845	11,238

3. Pricing and Distribution

The envisaged farm, as a new entrant into the market, has to penetrate the market and create awareness and product loyalty first. Therefore, the objective of the pricing policy should be to gain a foot hold in the market, get a sizable market share and attempt to sustain a reasonable profitability, which at the initial stage, could only be achieved through charging of lower prices that could influence users of the product. Accordingly, by taking the price of live chicken in to consideration Birr 20 per kg of poultry meat or 40 per head is proposed for the envisaged plant.

The product can be sold directly to bulk buyers. For individual buyers existing outlets such as super markets and specialized food items department stores can be used.

B. FARM CAPACITY AND PRODUCTION PROGRAMME

1. Farm Capacity

The proposed annual capacity of the poultry farm by considering the market study and minimum economies of scale is rearing 200,000 heads. The production capacity is determined based on 300 days per year operation of the farm.

2. Production Programme

The farm will operate at 70% and 85% of its rated capacity in the first and second year. Full production capacity will be achieved in the third year and then after.

Table 3.3

ANNUAL PRODUCTION PROGRAMME

Sr. No.	Description	Year 1	Year 2	Year 3-10
1	Production (heads).	140,000	170,000	200,000
2	Capacity utilization (%)	70	85	100

IV. FARM INPUTS AND UTILTIES

A. FARM INPUTS

The principal farm inputs required are chicken for breeding, poultry feed, and medicines. Chickens and poultry feed required by the plant can be acquired locally. The annual

requirement for farm inputs and the corresponding cost at 100% capacity utilization is given in Table 4.1. The total annual cost of farm inputs is estimated at Birr 3,740,000.

Table 4.1

ANNUAL REQUIREMENT AND COST ESTIMATES OF FARM INPUTS

Sr. No.	Description	Unit of Measure	Qty.	Unit price	Cost ('000 Birr)
1	Chickens (breed), day old	No.	220,000	10	2,200
2	Animal feed	Tonnes	720	2000	1,440
3	Medicines	Kg	50	2000	100
	Grand Total	**-**	**-**		**3,740**

B. UTILITIES

The major utilities required are: water for feeding chickens and general purpose, electric power for lighting and heating. The total yearly consumption of utilities at 100% capacity utilization rate and their estimated costs are given in Table 4.2. The total annual cost of utilities is estimated at Birr 195,652.

Table 4.2

ANNUAL UTILITIES REQUIREMENT AND ESTIMATED COST

Sr. No.	Description	Unit of Measurement	Qty.	Cost Birr	
				Unit Cost	Total Cost
1	Water	m^3	50,000	3.25	162,500
2	Electric power	kWh	70,000	0.4736	33,152
	Grand Total				**195,652**

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

Chicken production is typically carried out at so-called complexes. Each complex contains a feed mill, a hatchery, a processing plant, and chicken farms where the chicks are raised, usually in a 30-40 mi (48.3-64.4 km) radius from the processing plant. But the envisaged farm starts from the day old chicken from the hatchery and grows them for about six month and sells them.

The chicks live in large houses which hold as many as 20,000 birds. These grow-out houses are kept at about 85° F (29.4° C) through heating and ventilation controls. The birds are not caged, and typically they are provided with approximately 0.8 sq ft per bird. The floor of the house is covered with a dry bedding material such as wood chips, rice hulls, or peanut shells. The birds are fed a diet of chicken feed, which is typically 70% corn, 20% soy, and 10% other ingredients such as vitamins and minerals. When the chickens are old enough for slaughter, they are collected and shipped to the processing plant.

Sick chickens are treated with antibiotics or other medications. These chickens then go through a withdrawal period before slaughter, to make sure no medication residue remains in their meat. The chickens are usually watered through nipple drinkers, so that they don't spill and wet their bedding.

A significant waste produced in chicken farming is the feces of the birds. Because the flocks are so large, with 100,000 chickens per batch typical for a broiler growing-out farm, the amount of feces is enormous. So these feces has to be collected and used for fertilizer or bio gas generation for own energy source. By doing so the environmental effect will be controlled.

2. Source of Technology

Machinery and equipment for poultry rearing and processing plant 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 required plant machinery and equipment is given in Table 5.1. The cost of machinery and equipment is estimated at Birr 3.675 million, of which Birr 3.12 millions is required in foreign currency.

Table 5.1

MACHINERY AND EQUIPMENT REQUIREMENT FOR POULTRY REARING PLANT WITH ESTIMATED COSTS

Sr. No.	Description	Qty. No	Cost ('000 Birr)		
			F.C	L.C.	Total
1	Drinking system (set)	5	743.75	131.25	875
2	Feeding system (set)	5	743.75	131.25	875
3	Brooder (set)	5	1,190	210	1,400
4	Manure handling system (set)	5	446.25	78.75	525
	Grand Total		**3,123.75**	**551.25**	**3,675**

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^2, will amount to Birr 6.3 million. The rearing buildings covers the $3000m^2$ area, the store $350m^2$ and the office building 150 m^2.

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 5.1.

Table 5.1

INITIAL LAND LEASE RATE IN ADDIS ABABA

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

Source; Addis Ababa City Land Administration Authority

As can be seen from Table 5.2, the initial land lease rate ranges from Birr 1,167.3 to 132.3 per m^2 .

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^2 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 5.2 and Table 5.3.)

Table 5.2

LEASE PERIOD

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

Table 5.3

LEASE PAYMENT PERIOD

Sr. No.	Service Type	Period of Payment According to the Grade of Towns
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^2 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.

VI. MANPOWER AND TRAINING REQUIREMENT

A. MANPOWER REQUIREMENT

The total manpower required is 27 persons. Details of manpower and annual estimated labour cost including the fringe benefits are given in Table 6.1. The total annual manpower cost is estimated at Birr 260,250.

B. TRAINING REQUIREMENT

The poultry rearing technology is simple and does not require any special training. The supervisors, laborers and veterinary doctor needs a one week orientation in one of the poultry rearing farms operating in the country. The cost of such training is estimated at Birr 15,000.

Table 6.1

MANPOWER REQUIREMENT AND ESTIMATED LABOUR COST

Sr. No.	Description	No. of Persons	Salary, Birr	
			Monthly	Annual
1.	Manager	1	2,500	30,000
2.	Secretary	1	700	8,400
3.	Production supervisor	1	1,200	14,400
6.	Veterinary doctor(diploma level)	1	1,500	18,000
7.	Laborer	10	4,500	54,000
8.	Electrician	1	600	7,200
11.	Accountant	1	1,200	14,400
12.	Sales/Purchase man	1	900	10,800
15.	Store keeper	2	1,000	12,000
16.	Cleaner	1	350	4,200
17.	Cashier	1	500	6,000
18.	Driver	2	1000	12,000
19.	Guard	4	1,400	16,800
	Sub-Total	**27**		**208,200**
	Employees' benefit (25% of basic salary)			52,050
	Total			**260,250**

VII. FINANCIAL ANALYSIS

The financial analysis of the poultry rearing and processing 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	90 days
Finished products	3 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 12.84 million, of which 24% is 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 ('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	551.3	3,123.75	3,675.00
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	614.74	-	614.74
	Total Investment cost	**9,719.84**	**3,123.75**	**12,843.59**

* *N.B Pre-production expenditure includes interest during construction (Birr 547.38 thousand), training (Birr 15 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 6.60 million (see Table 7.2). The raw material cost accounts for 56.62 per cent of the production cost. The other major components of the production cost are land lease, depreciation and financial cost which account for 14.87 %, 12.04% and 6.79 % respectively. The remaining 9.68% is the share of direct labour, utility , repair, maintenance, labour overhead and other administration cost.

Table 7.2

ANNUAL PRODUCTION COST AT FULL CAPACITY ('000 BIRR)

Items	Cost	%
Raw Material and Inputs	3,740.00	56.62
Utilities	195.65	2.96
Maintenance and repair	183.75	2.78
Labour direct	124.92	1.89
Labour overheads	52.05	0.79
Administration Costs	83.28	1.26
Land lease cost	982.33	14.87
Total Operating Costs	**5,361.98**	81.17
Depreciation	795.00	12.04
Cost of Finance	448.66	6.79
Total Production Cost	**6,605.64**	**100**

C. FINANCIAL EVALUATION

1. Profitability

Based on the projected profit and loss statement, the project will generate a profit through out its operation life. Annual net profit after tax will grow from Birr 1.14 million to Birr 1.68 million during the life of the project. Moreover, at the end of the project life the accumulated cash flow amounts to Birr 17.63 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.

$$BE = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable Cost}} = 30\ \%$$

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 6 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 17.12 % 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 5.59 million which is acceptable.

D. ECONOMIC BENEFITS

The project can create employment for 27 persons. In addition to supply of the domestic needs, the project will generate Birr 3.55 million in terms of tax revenue. The poultry farm has a backward linkage effect on animal feed processing industries and a forward linkage effect on food processing industries. There is also a substantial export potential.