Pre-Feasibility Study

ENVIRONMENTAL CONTROLLED LAYER FARM
(30,000 Layers)

Small and Medium Enterprises Development Authority

Ministry of Industries & Production

Government of Pakistan

www.smeda.org.pk

HEAD OFFICE

4th Floor, Building No. 3, Aiwan-e-Iqbal Complex, Egerton Road,
Lahore
Tel: (92 42) 111 111 456, Fax: (92 42) 36304926-7
helpdesk@smeda.org.pk

REGIONAL OFFICE PUNJAB	REGIONAL OFFICE SINDH	REGIONAL OFFICE KPK	REGIONAL OFFICE BALOCHISTAN
3rd Floor, Building No. 3, Aiwan-e-Iqbal Complex, Egerton Road Lahore, Tel: (042) 111-111-456 Fax: (042) 36304926-7 helpdesk.punjab@smeda.org.pk	5TH Floor, Bahria Complex II, M.T. Khan Road, Karachi. Tel: (021) 111-111-456 Fax: (021) 5610572 helpdesk-khi@smeda.org.pk	Ground Floor State Life Building The Mall, Peshawar. Tel: (091) 9213046-47 Fax: (091) 286908 helpdesk-pew@smeda.org.pk	Bungalow No. 15-A Chaman Housing Scheme Airport Road, Quetta. Tel: (081) 831623, 831702 Fax: (081) 831922 helpdesk-qta@smeda.org.pk

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1 EXECUTIVE SUMMARY

Eggs are vital source of providing high quality of animal proteins, having excellent source of iron, phosphorus, selenium and other minerals which are daily requirement of the human body. Animal Protein is more valuable than that of plant protein. Per capita consumption of eggs in many countries is far below the minimum recommended level. The average availability of protein in Pakistan is 72.0 grams a day, which is far less than the recommended daily dietary protein consumption of 102.7 grams. In Pakistan Egg numbers are increasing by the rate of 6.79% per anum and about 69.76% of Eggs comes from commercial layer farming and rest of it comes from Rural Poultry (Desi).

Layer sector is contributing its major share to provide animal protein to the masses but this important sector is facing great problems in the form of heat stress, hot and humid weather conditions, mortality in flocks by poor management practices. These all factors result severe shortage of eggs in country. Environmental controlled houses can overcome this critical situation, which counteracts the adverse effects of heat stress providing tunnel ventilation and enhancing the wind chill effect. These houses when equipped with highly mechanized system of automatic chain feeding and nipple drinking makes the environment quite conducive for eggs production in layer farm.

Day old chicks of Layer are initially reared for a period of 18 weeks. On completion of 18 weeks, the birds then start laying eggs for a period of next 82 weeks. These birds will be kept in cages through out 100 weeks. On an average, one layer lays about 450-480 eggs per laying season of 82 weeks. After the completion of laying period, the layers are sold in the market as culled birds. The selling prices of these birds are determined on per bird basis.

30,000 layers are viable economic size to start an environmental controlled layer farm, where the operational and fixed costs are justifiable because, below 30,000 layers means to increase the production costs while the fixed costs remain same. A Controlled Environmental Layer farm with a population of 30,000 layers started in a pre fabricated building shed requires total investment estimated at Rs 38.141 million.

This project is proposed to be started on 50% debt and 50% equity basis. Projected IRR, NPV and Payback of proposed Pre-feasibility study are 45%, Rs. 65.853 million and 4.32 years respectively.

2 INTRODUCTION

2.1 Project Brief

Environmental Controlled Layer Farm is a Live Stock based project. This can be started in both rural and urban areas. The focus of the commercial environmental controlled shed layer industry is the production of eggs under intensive husbandry. The egg component includes production of white and brown eggs that are either marketed in the bulk processed, or sold as value-added products.

Day old chicks of Layer are initially reared for a period of 18 weeks. On completion of rearing period, the birds then start laying eggs for a period of next 82 weeks (19 months). On an average, one layer lays about 480 eggs per laying season of 82 weeks.

After the completion of laying period, the layers are sold in the market as culled birds. The selling price of these birds is determined on per bird basis. It should be kept in mind that many factors must be considered when evaluating the welfare implications of a particular management procedure, including the health, productivity, physiology, and behavior of the layer chicks.

2.2 Opportunity Rationale

Poultry sector is one of the vibrant segments of agriculture industry of Pakistan. This sector generates employment (direct/indirect) and income for about 1.5 million people. Its contribution in agriculture growth is 4.8% and in Livestock value addition is 9.8%. Poultry Development Policy revolves around improving regulatory framework; disease control and genetic improvement in rural poultry; hi-tech poultry production under environmentally controlled housing; processing and value addition; improving bio-security; need based research and development and framers training & education. It envisages poultry sectors growth of 15-20 percent per annum.[1] The average availability of protein in Pakistan is 72.0 grams a day, which is far less than the recommended daily dietary protein consumption of 102.7 grams according to the World Health Organization standards. [2]

Despite having nutritional supremacy, abundant availability and within the reach of common man, the per capita consumption of eggs in many countries, including India, is far below the minimum recommended level is half an egg per head per day. However, the egg has been under intense attack by anti-cholesterol advocates. The egg has been blamed and defamed as one of the major culprits in causing heart problems. Layer farming is a vital source for providing high quality animal protein (Eggs) which is daily requirement of the human body. Animal Protein is more valuable than that of plant protein.

[1] Source: Economic Survey of Pakistan 2010-11(Chapter No.2, Page 30)
[2] Source: Economic Survey of Pakistan 2010-11. (Chapter No:11, Page 149)

The following table shows the per capita consumption of eggs and poultry meat in 2008:

Table 2-1: Per Capita Availability of Eggs for the years 2007-11[3]

	2007-08	2008-09	2009-10	2010-11
Eggs (Nos)	66	67.2	69.6	72

2.3 2.3 Nutrient composition and Protein quality of eggs

The fat soluble vitamins A, D, E and K are found in eggs along with the B-complex vitamins. Egg contains no vitamin C. Eggs are also an excellent source of iron, phosphorus, selenium and other minerals. Its nutritional value, chemical composition and % contribution towards daily nutrient requirements are presented in Table 2-2. About 60% of the fat in an egg is in the form of unsaturated fatty acids. These unsaturated fatty acids are often considered better for our health than the saturated fatty acids. Eggs contain very little carbohydrates and no fiber. One egg contains approximately 85 calories, which is only 3-4% of the total calorie needs of an adult human being.

Table 2-2 Protein quality of egg protein in comparison with other foodstuffs[4]

Food stuff	Biological value	Protein efficiency ratio	Net Protein utilization	Chemical score
Egg	96	4.5	91	100
Cow's milk	84	3.0	75	65
Meat	80	2.8	76	70
Fish	85	3.0	72	60
Liver	77	2.9	65	66
Pulses	56	1.6	45	44

Table 2-3 Nutrient composition of 100g of egg content and the percentage of daily recommended nutrients contributed by two eggs[5]

Nutrient	Content in 100g of egg contents	Requirements /day/man	%contribution by two eggs
Protein (g)	13.3	67	22.2
Lipids(g)	11.4	50	76.0
Ash(g)	0.8	0.2	1.6
Linoleic acid (g)	1.8	12.5	14.4
Cholesterol(mg)	400	1500-2000	852
Energy(Kcal)	162	2700	5400

[3] Source: Economic Survey of Pakistan 2010-11. (Chapter No:11, Page 149)
[4] Source: http://agrihunt.com/livestock-industry/1819-the-incredible-egg-.html
[5] Source: http://agrihunt.com/livestock-industry/1819-the-incredible-egg-.html

Saturated acids(g)	3.34	14.97	6.68
Fatty acids(g)	6.4	20.45	13.04
Calcium(g)	50	0.8	1.6
Phosphorus(g)	178	0.9	1.8
Iron(mg)	1.44	12	24
Vitamin A (I.U)	634	5000	1268
Vitamin D (I.U)	49	400	98
Vitamin B_1(mg)	0.062	1.5	0.124
Vitamin B_2(mg)	0.508	2.0	1.016
Vitamin C(mg)	----	75	------

2.4 Proposed Capacity

30,000 layers are viable economic size to start an environmental controlled layer farm, where the operational and fixed costs are justifiable because, below 30,000 layers means to increase the production costs while the fixed costs remain same. These birds are kept for approximately twenty three months, which includes a rearing period of 18 weeks and laying period of 82 weeks.

2.5 Total Project Cost

A Controlled Environmental Layer farm with a population of 30,000 layers started in a pre fabricated building shed requires total capital investment estimated at Rs 31.350 million for land, building, shed and purchasing farm machinery. Rs. 6.792 million is estimated for working capital that should be used to purchase day old chicks and raw material (feed & vaccines etc). The total project cost is estimated at Rs. 38.141 million.

3 CURRENT INDUSTRY STRUCTURE

The current investment in Poultry Industry is about Rs. 200.00 billion. Poultry sector has shown a robust growth at the rate of 8-10 percent annually which reflects its inherent potential. Pakistan's poultry industry is importing 100,000 Grandparents (GP) chicks annually from Australia, Holland, Germany and USA with the cost of US$100 per day-old female chick. [6]

Poultry feed mills are the major player in the poultry industry, which produce a specific formula feed mix. Poultry feed consists of rich protein elements like Soya bean meal, canola meal, rapeseed meal, sunflower meal and rich energy elements like grains, gluten, etc. When feed efficiency matters most you can get the right eggs from the layer. The major component of cost of production of eggs accounts for feed cost.

Approximately 69.76% of the total eggs production comes from Farm Eggs and the rest from Rural Poultry (Desi), Duck and Drake & Duckling. In 2010-11, 32.54

[6]Source: Pakistan Poultry Association (data as per year 2010)

millions commercial layers produced 8,690 million eggs. Egg availability in Pakistan has been growing at an annual average rate of 6.79% during the years 2008 to 2011. Population of Commercial Layer and Eggs numbers for the year 2008-11 are given in the below table.[7]

Table 3-1: Commercial Layer and Egg Production 2008-2011[8]

Item	Units	2008-09	2009-10	2010-11
Layer	Million No's	28.42	30.41	32.54
Eggs	Million No's	7,620	8,137	8,690

4 NEED FOR ENVIORNMENTAL CONTROLLED LAYER FARM (ECLF)

Layer sector is contributing its major share to provide animal protein to the masses and is striving hard to fulfill the gap of animal protein in the country. But this important sector is facing a great problem in the form of heat stress. Hot and humid weather conditions coupled with manual and poor management practices increases the mortality in flocks, depress their growth and make egg production an unmanageable and uneconomical pursuit, resulting into severe shortage of eggs in country. Environmental controlled houses can overcome this critical situation, which counteracts the adverse effects of heat stress providing tunnel ventilation and enhancing the wind chill effect. These houses when equipped with highly mechanized system of automatic chain feeding and nipple drinking makes the environment quite conducive for eggs production in layer farm.

Though this industry is a source of food and employment for million of people, but is facing a major impediments in its progress in the form of heat stress. Pakistan is a tropical country and during summer the temperature reaches up to 45° -- 50°C.

Their business is also adversely affected for four long months due to severe environment. During this period they have to either continue their flock compromising with poor performance in feed intake, growth rate, weight gain, FCR in layers along with mortality or they have to totally close their business to avoid all these risks.

4.1 Comparative Efficiency of Environment Control House (ECH) and Conventional Open-Side House (COH)

The modern trend of Environment Control Houses (ECH) in poultry eggs production has brought a great revolution in poultry industry of Pakistan in the recent years. This has solved a great hurdle of heat stress in the way economical commercial layer production. The ECH with evaporative cooling system, providing tunnel ventilation, giving the wind chill effect has markedly improved the production system. The

[7]Source: Economic Survey of Pakistan 2010-11. (Chapter No: 2 , Page No: 29)
[8] Source: Economic Survey of Pakistan 2010-11. (Chapter No: 2 , Page No: 29)

technology of ECH is rapidly becoming popular among layer producers due to its following significant advantages:

1. The ECH brings down the temperature by 10°C to 15°C as compared to the conventional open-sided houses (COH) and makes it comfortable like colder regions.
2. ECH maintains the uniform temperature round the clock providing very conducive environment to the layers avoiding fluctuation in the day and night temperature.
3. ECH being complete closed system has minimized the incidence of diseases in layers.
4. Installation of highly mechanized automatic feeding and nipple drinking system in ECH has provided the solution of manual and poor management practices.
5. Equal distribution of feed and water to layers through automatic system in ECH has markedly improved the uniformity up to 95% as compared to 75% in COH.
6. Low temperature should be controlled with the help of diesel heaters and high temperature with evaporative cooling system.
7. Watering and feeding should be given through automatic nipple drinking and feeding system.
8. Specific vaccination schedule and Prophylactic medication should be adopted for disease control.
9. Bio security, sanitation and disinfection program should be strictly followed during and after the completion of one laying period.
10. Computerized record should be maintained for feed intake, body weight, FCR and mortality of layers.

All the above significant features in ECH are necessary factors to reduce the cost of production of layers as compared to COH.

5 SALES AND MARKETING

Layer starts giving eggs at the age of 18 weeks. It is proposed that layer farm should be start in the month of June or July. The layer is ready to lay eggs in October/November. The demand for eggs increases during the winter season and, as a result of high demand, the prices of eggs also increases in winter.

Eggs are packed in trays and can be sold in bulk to the wholesale markets in the urban cities. The eggs are more liable to be damaged during transportation. The profits and losses in marketing of eggs depend on the proper transportation methods. Eggs should be transported in proper containers. Bamboo baskets, wooden boxes, and pitch board trays, collapsible cardboard boxes and in plastic trays are the

containers used for transporting eggs. Of these, Bamboo baskets and wooden boxes are the safest ways.

Retail buyers are also available who will directly purchase eggs from the farm. Eggs are perishable commodity and cannot be stored for longer period of time. Although collection, packaging and handling of eggs has improved with the use of loader vehicles, but it is an established fact that greater the distance between the eggs producer and consumer, more complicated is the marketing system including their collection, handling and transportation to the consumers or retailers.

The prices of eggs usually high in winter season as compared to the summer. According to the market prices of eggs, we have taken the average estimated prices of eggs as Rs 3,360 per 30 dozen which means Rs. 112 per dozen. For the sake of calculation in this Pre-feasibility study we consider Rs. 85 per dozen on averages. The price of layer day old chick is taken as Rs. 72 as determined by the Layer DOC suppliers of Pakistan.

6 LAYER FARM MANAGEMENT

Layer house sanitation begins with a clean sanitized house prepared well in advance of arrival of chicks. Each house should remain empty at least two weeks after, it is disinfected and fumigate .The effectiveness of sanitizing a house is depended upon the extend of the cleaning before the germicide is applied. This cleaning helps to control disease because,

a) It reduces number of pathogenic material

b) Remove material that helps in multiplication of pathogens.

c) Expose surface to the disinfectant and fumigants.

6.1 Selection of the Layer Breed

Selection of the good breed for layer chicks is one of the most integral parts of the project investment. The following seven breeds are very good in terms of productivity output and feed consumption pattern.

1) B 300

2) Hyline W-36

3) Nickwich

4) Shaver

5) Hisex

6) L.S.L

7) Noviage whiky

We have taken Hyline W-36 for this project, because of the following reasons:

- Liveability---the strongest Hyline W-36 characteristics is its liveability exceeding even our expectations. Growing house 96% to 98% and Laying house 96% to 98%
- Resistances to Stress---- Flock in production through worst climate conditions confirm that Hyline W-36 is a forgiving layer and bounces back.
- Feed Conversion---- This breed is a proven feed converter. Under identical conditions, it has top feed converter. She is light weight but rugged 1.29 to 1.35 kg of feed per dozen eggs.
- Early Peaks--- Hyline W-36 earlier and higher. It starts to payback its daily feed cost/bill earlier than any other layer strain in the market.
- Hen Housed eggs production---- Hyline W-36 lays highest number of eggs with excellent persistency of lays. The result maximum hen- hosed eggs production is 450 to 460 eggs at the end of 110th week of bird's age.

6.2 Management of Chicks

The chicks should be of uniform size, active, alert and bright eyed. The shank or leg covering (skin) of healthy chicks should appear bright and shiny. Improved and high yielding chicks should be purchased from reputed farms.

6.2.1 Pre-Brooding Management

In the process of pre-brooding management following measures are generally considered for taking good results.

- Most important factor is the selection of area in the shed .The house should lie empty for one to two weeks prior to placing new chicks in them.
- Clean and disinfect cages, equipment, building interior and attached service areas and equipment.
- Check to make sure equipment is working properly and is adjusted to the right height.
- Remove all old feed from bins, hoppers, and troughs. Disinfect and allow to dry before new feed is delivered.
- Place rodenticide where it will not be consumed by the chicks.
- Good ventilation and environmental conditions will greatly help in reducing smell. There is no hope of overall hygiene process being fully effective if there is any much left in the house.

- A basic essential is that disinfection Programme must be most carefully planned. The disinfection of a building implies the elimination from the house all microorganism that are capable of causing disease.
- One day before delivery of chicks; Check water system, adjust to proper height for chicks. Disinfect and flush water lines and set heating system at 32–33°C (90–92°F).

6.2.2 Brooding Management

On delivery day

- The chicks should be arriving early in the morning so that the management have full day to observe them and take care of them.
- Check brooder temperatures,
- Water tanks must be full or water system should be in operation. As chicks are placed, trigger water cups or nipples to encourage drinking.
- When nipple drinkers are used, reduce the water pressure so birds can see the drop of water hanging on the drinker.
- Feed should be placed on paper in cage.
- Operate feeders at highest feed level.
- Keep light at high intensity 20–22 hours per day for the first week.

After that

- In the beginning, starter feed might be used as a source of energy for chicks, starter feed is easily digestible and due to its high fiber content reduce pasting problem. It is a good source of energy.
- Grow pullets in strict isolation from older birds. Maintain good sanitation. Plan work routines so that disease causing agents cannot be carried from older birds to the growing pullets.
- During the first six weeks, operate feeders to provide feed at least twice daily, or more often. After six weeks, check feed consumption and body weights against the given charts provided by Day Old Chick Suppliers.
- Weigh 100 pullets weekly during the growing period, beginning at five weeks of age.
- Check water availability in each cage row daily. Check for and repair leaks. Raise waterers as the birds grow (nipples higher than the birds' heads; cups or troughs level with their backs).
- Plan and follow a vaccination schedule to fit the area.

- Remove mortality daily and dispose of properly. Examine for causes of excessive mortality.
- Management should Place the chick guard (2-3 feet from the edge and increase area weekly this will reduce cannibalism and increase feed utilization.
- Management should do flushing at start by using 250 gm sugar/gallon of water, which is mixed to provide carbohydrate to chick and clear the digestive tract.
- Farm manager should be present and ever alert, count the number of the chicks, closely regulates temperature of shed and of the brooder and above all observes closely, all requirements of birds.

6.3 Feeding

The requirement of feed during laying depends on the rate of eggs production and the body weight of layer birds. The birds may need more feed in winter and less feed in summer. On average a bird take 90 to 94 grams feed per day in laying season. During summer months the flock is under severe stress, it is suggested to temporarily change the ration to a higher level of protein content. The actual feed consumption may be influenced by several factors as follows:

- Body weight of the bird.
- Rate of egg production.
- Season and weather condition.
- Health and physical condition of the bird.
- Feed quality such as protein contents, caloric value of feed etc.

Generally the feed intake increases with an increase in egg production.

6.4 Caging System

The battery cage system for laying hens was introduced commercially on a wide scale in the 1950's. Since that time, it has become the predominant method for maintaining hens. Cages provide the egg producer with an efficient and cost-effective means of collecting eggs, disposing of wastes, reducing feed wastage, maintaining an adequate environmental temperature, and inspecting the condition of individual birds. "H" frame battery layer production system has been put into the international market for many years and helped the layer farm management to achieve good performances. In this pre-feasibility, we recommend to acquire 8 tiers "H" type battery cages for the production of 30,000 layers.

6.5 Disease prevention and control

Remember following points to prevent diseases in layers.

A hygiene progrmme is fundamental to successful layer production. Following control and preventive measure should be taken for healthy eggs production.

i. Start with disease-free chicks.

ii. Vaccine chicks against Ranikhet and Marek's disease.

iii. Use effective drugs in the feed, or a vaccination program to prevent coccidiosi.

iv. Keep feed free from aflatoxin.

v. Do not allow visitors or attendants inside the layer farm unless they wear disinfected boots and clean clothing.

vi. When there are several age groups on the farm, always care for the youngest birds first while performing daily routine works.

vii. Vaccination can be applied to chicks through water. The medicine can also be mixed in the water. Vaccination is provided to the birds once in the rearing period and once in the laying period.

6.6 Layer house temperature and Ventilation

On the first week 90-92^{o} F is quite comfortable. This may be reduced at the rate of 5^{o} F weekly until 7 ^{o} F is reached on the sixth week. When chicks circle, wide, it is too hot. If they tend to crowd, under the hover it is too cool. In either case, adjustment is needed immediately. The main functions of ventilation are to maintain Oxygen, keep CO_2 at low level, remove dust or moisture and ammonia from the house and maintain required temperature. Air movement requirements are best determined by observing bird comfort, litter condition, and odor build up. If necessary, the exhaust fan may be used in the house.

6.7 Laying mechanisms

After the completion of rearing phase of 18 weeks, the layers will produce eggs for next 82 weeks. During the rearing phase, the birds consume feed and are non-productive. After the rearing phase is over, the birds start laying eggs and remain productive for the next 82 weeks. In this pre-feasibility, we proposed to insert flock of 30,000 birds from the month of June/July so that in winter season we can get maximum rate of Eggs.

6.8 Ten Years Schedule for Rearing and Laying period

Birds can be reared from rental sheds but in this Pre-feasibility study we are proposing that birds should be reared in house. The schedule for rearing and laying period for the first ten years of operation of the farm is in below table.

Table 6-1: Ten Years Schedule for Rearing and Laying period

Years	Rearing (Months)	Laying (Months)	Fumigation (Months)	Total Months
1	4.14	7.86	-	12.00
2	0.53	10.98	0.49	12.00
3	3.62	8.38	-	12.00
4	1.02	10.49	0.49	12.00
5	3.12	8.88	-	12.00

6	1.51	9.99	0.49	12.00
7	2.63	9.37	-	12.00
8	2.01	9.50	0.49	12.00
9	2.14	9.86	-	12.00
10	2.53	8.98	0.49	12.00

Further Calendar for above ten years is attached in ANNEXURE 12.2

6.9 Culling of Unproductive layers

Culling is the procedure of selection and rejection of unproductive and poor producers. Culling is a very important job for running layer farm profitably. Poor layer should be culled to minimize the cost of production. The birds that have laid well for short period but have stopped laying for one reason or another should be culled out. Sales price varies in a range of Rs.90 to Rs. 190 as per demand.

7 MANPOWER REQUIREMENTS

Semi skilled workers are needed to look after the feeding, vaccination and cleaning at the farm. Almost 7 persons should be hired to mange the operations of the automated controlled layer farm for 30,000 birds.

Table 7-1: HR Requirement

Farm Employees	N0.	Monthly Salary (Rs)	Annual (Rs)
Production Supervisor	1	25,000	300,000
Accounts & Admin Officer	1	15,000	180,000
Housemen	4	8,000	384,000
Electrician	1	12,500	150,000
Total	**7**		**1,014,000**

8 FARM MACHINERY & EQUIPMENT

8.1 Characteristics of battery Cages systems

We propose to acquire battery cages system for maintaining the 30,000 layers in the cages system. The equipment has following features.

- The hot dipped galvanizing process make the complete system more anticorrosive and durable and it can be used for 15-20 years.
- The centralization of the management can ensure investor save the energy and material.
- The advanced ventilation system, lighting system and automatic controlling system can save energy, increase efficiency and lower egg feed rate.

- Compared with manure belt removal system, the product makes manure drier and easier to remove and recycle.
- It is the most ideal raising equipment for products of the eggs and meat, such as "Healthy eggs" and "unpolluted broiler", etc.

8.2 Characteristics of Nipple Automatic Drinking system

Drinking system adopting advanced nipple automatic drinking system with no leakage to keep the poultry house dry, and to reduce the risk of disease infection is essential for the better productivity.

8.3 Characteristics of Feces cleaning system

Belt manure removal system makes manure drier and easier to remove and recycle, and heighten the efficiency or refusing manure. By using this system, it is very much convenient to transport the manure directly to the vehicle outside the house.

8.4 Farm Machinery, Equipment, Furniture & Fixture Requirement

Following Farm Machinery, Equipment, Furniture & Fixture required for 30,000 Layers farm house.

Table 8-1: Farm Machinery and Cages of 30,000 layers[9]

Description	Amount (Rs.)
Wire Structure	
Sheet Structure	
Feeding System	
Drinking System	
Manure Removal System	
Heating System	
Ventilation System	
Electrical System	
Fitting Material	
Total Machinery & Cages systems	**16,500,000**
Erection and installation@2% of machinery	330,000
2 Generator sets (45 KVA)	1,800,000
Stabilizer 45 KVA	400,000
Total Machinery and Equipment	**19,030,000**

[9] Detail of Machinery is attached in ANNEXURE 12.3

Table 8-2: Office Equipment

Description	QTY	Unit Rate	Total Cost (Rs.)
Computers with UPS	1	45,000	45,000
Printers	1	15,000	15,000
Telephone sets	1	1000	1,000
Total			**61,000**

Table 8-3: Office Furniture & Fixtures

Description	QTY	Unit Rate	Total Cost (Rs.)
Furniture set	1	80,000	80,000
Air Conditioner (1.5 tons)	1	45,000	45,000
Total			**125,000**

9 LAND & BUILDING

9.1 Recommended Mode for Acquiring Land

It is recommended that the proposed project should be started on purchased land.

Generally, the cost of land per acre prevailing in the sub-urban areas of Lahore, Kasur, Pattoki and Shekhupura is on average around Rs 2.0 million per acre. This pre-feasibility suggests the acquisition of 1 acre land to start an automated and environmental controlled layer farm for 30,000 birds.

9.2 Suitable Locations

Sub-urban and rural areas of Lahore, Kasur, Pattoki and Shekhupura other major cities of the country are recommended for starting an Environmental controlled layer farm. Setting up a farm at an isolated place will minimize the risk of disease. Proximity of the farm to the city enables the farmer to have a quick communication with the market for the purchase of Day Old Chicks, farm inputs (feed, etc.), and selling of eggs to the market.

Table 9-1: Infrastructure Requirement

Description	Area (sq ft)	Cost (Rs/Sq.ft)	Total (Rs.)
Shed space for Layers (L430X40)	17,200	350	6,020,000
Feed Store	500	350	175,000
Pre fabricated Insulation Cost	17,200	70	1,204,000
Admin Office Block	800	800	640,000
Pavement/driveway	212	200	42,400
Boundary walls			800,000
Rooms for Guards and workers	400	600	240,000
Total Building Infrastructure Cost			**9,121,400**

9.3 Site layout Plan on 1 acres area

Layout plan is attached in ANNEXURE 12.4

9.4 Infrastructure Requirements

Layer farming needs to be handled tactically, right from the selection of the site to the final stage when the eggs are sold. The farm should be located at a place where transportation of eggs, feeds, vaccines and culled birds can be handled easily. The entrepreneur should make sure that the following things are available at the site before setting up the layer farm:

- Adequate Road infrastructure for transportation
- Availability of Electricity, water and gas connections
- Quality of clean drinking Water for chicks
- Drainage of rain water

10 PROJECT COST AND FINANCIAL ANALYSIS

Capital Investment	**Rs. in actuals**
Land	2,000,000
Building and Civil Works	9,121,400
Plant and Machinery	19,030,000
Furniture/ Fixture & Equipment	186,000
Contingencies (1% of machinery)	190,300
Pre-operational Expenses	822,000
Total Capital Costs	**31,349,700**

Working Capital	**Rs. in actuals**
Working Capital	6,791,607
Total Capital Costs	**6,791,607**

Total Investment	**38,141,307**

Initial Financing		**Rs. in actuals**
Debt	50%	19,070,654
Equity	50%	19,070,654

Internal Rate of Return (IRR)	45%
Payback Period (yrs)	4.32
Net Present Value (NPV) in Rs.	65,852,862

10.1 Projected Income Statement

Statement Summaries **SMEDA**

Income Statement

Rs. in actuals

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Sales	41,705,150	67,156,026	53,783,653	77,834,607	68,844,824	90,036,610	87,859,827	103,930,949	111,825,075	119,285,886
Cost of Goods Sold										
Raw Material	30,335,612	35,523,935	31,612,277	38,316,821	35,658,936	41,486,124	40,203,033	44,804,943	45,304,029	48,299,643
Payroll (Production Staff)	834,000	875,700	919,485	965,459	1,013,732	1,064,419	1,117,640	1,173,522	1,232,198	1,293,808
Machine Maintenance	380,600	418,660	460,526	506,579	557,236	612,960	674,256	741,682	815,850	897,435
Direct Electricity	3,504,000	3,854,400	4,239,840	4,663,824	5,130,206	5,643,227	6,207,550	6,828,305	7,511,135	8,262,249
Brooding Expense	210,000	220,500	-	243,101	-	268,019	-	295,491	-	325,779
Generator Diesel Expenses	1,203,040	1,323,344	1,455,678	1,601,246	1,761,371	1,937,508	2,131,259	2,344,385	2,578,823	2,836,705
Total	36,467,252	42,216,539	38,687,807	46,297,030	44,121,482	51,012,257	50,333,738	56,188,327	57,442,035	61,915,619
Gross Profit	**5,237,898**	**24,939,488**	**15,095,846**	**31,537,577**	**24,723,342**	**39,024,353**	**37,526,089**	**47,742,622**	**54,383,040**	**57,370,267**
Operating Expenses										
Payroll (Admin)	180,000	189,000	198,450	208,373	218,791	229,731	241,217	253,278	265,942	279,239
Fumigation Cost	-	42,000	-	46,305	-	51,051	-	56,284	-	62,053
Electricity Expense	438,000	481,800	529,980	582,978	641,276	705,403	775,944	853,538	938,892	1,032,781
Administrative & Factory Overheads	104,263	167,890	134,459	194,587	172,112	225,092	219,650	259,827	279,563	298,215
Amortization (Pre-operational Expenses)	202,460	202,460	202,460	202,460	202,460	-	-	-	-	-
Depreciation	2,377,670	2,377,670	2,377,670	2,377,670	2,377,670	2,377,670	2,377,670	2,377,670	2,377,670	2,377,670
Mortality loss	266,020	244,801	217,704	273,969	235,738	306,545	255,183	342,921	276,136	383,897
Total	3,568,413	3,705,621	3,660,723	3,886,341	3,848,047	3,895,492	3,869,663	4,143,518	4,138,203	4,433,855
Operating Profit	**1,669,486**	**21,233,867**	**11,435,123**	**27,651,236**	**20,875,294**	**35,128,861**	**33,656,426**	**43,599,104**	**50,244,837**	**52,936,412**
Non-Operating Expenses										
Financial Charges on Long-term Loan	982,324	914,514	841,280	762,188	676,767	-	-	-	-	-
Financial Charges on Running Finance	1,086,657	1,081,346	-	-	-	-	-	-	-	-
Total	2,068,981	1,995,861	841,280	762,188	676,767	-	-	-	-	-
Profit Before Tax	**(399,495)**	**19,238,006**	**10,593,843**	**26,889,048**	**20,198,527**	**35,128,861**	**33,656,426**	**43,599,104**	**50,244,837**	**52,936,412**
Tax	-	4,809,502	2,648,461	6,722,262	5,049,632	8,782,215	8,414,107	10,899,776	12,561,209	13,234,103
Profit After Tax	**(399,495)**	**14,428,505**	**7,945,382**	**20,166,786**	**15,148,895**	**26,346,646**	**25,242,320**	**32,699,328**	**37,683,628**	**39,702,309**

10.2 Projected Balance Sheet

Statement Summaries **SMEDA**
Balance Sheet

Rs. in actuals

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Assets											
Current assets											
Cash	-	500,000	8,403,575	20,735,074	38,761,436	58,036,042	83,092,445	113,268,701	144,741,288	187,108,870	225,753,294
Stocks and Inventory	6,791,607	6,791,607	7,734,729	5,196,539	8,388,089	5,861,743	9,123,238	6,608,718	9,904,916	7,447,238	10,739,709
Receivable	-	799,825	1,287,924	1,031,467	1,492,718	1,320,312	1,726,730	1,684,983	1,993,196	2,144,590	2,287,675
Total Current Assets	**6,791,607**	**8,091,432**	**17,426,227**	**26,963,080**	**48,642,244**	**65,218,096**	**93,942,412**	**121,562,402**	**156,639,400**	**196,700,698**	**238,780,677**
Gross Fixed Assets	30,337,400	30,337,400	30,337,400	30,337,400	30,337,400	30,337,400	30,337,400	30,337,400	30,337,400	30,337,400	30,337,400
Less: Accumulated Depreciation	-	2,377,670	4,755,340	7,133,010	9,510,680	11,888,350	14,266,020	16,643,690	19,021,360	21,399,030	23,776,700
Net Fixed Assets	**30,337,400**	**27,959,730**	**25,582,060**	**23,204,390**	**20,826,720**	**18,449,050**	**16,071,380**	**13,693,710**	**11,316,040**	**8,938,370**	**6,560,700**
Intangible Assets											
Pre-operational Expenses	1,012,300	809,840	607,380	404,920	202,460	-	-	-	-	-	-
Total Intangible Assets	**1,012,300**	**809,840**	**607,380**	**404,920**	**202,460**	**-**	**-**	**-**	**-**	**-**	**-**
TOTAL ASSETS	**38,141,307**	**36,861,002**	**43,615,667**	**50,572,390**	**69,671,424**	**83,667,146**	**110,013,792**	**135,256,112**	**167,955,440**	**205,639,068**	**245,341,377**
Liabilities & Shareholders' Equity											
Current liabilities											
Running Finance	6,791,607	6,758,414	-	-	-	-	-	-	-	-	-
Total Current Liabilities	**6,791,607**	**6,758,414**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Long-term liabilities											
Long-term Loan	12,279,046	11,431,430	10,516,004	9,527,345	8,459,592	7,306,420	7,306,420	7,306,420	7,306,420	7,306,420	7,306,420
Total Long Term Liabilities	**12,279,046**	**11,431,430**	**10,516,004**	**9,527,345**	**8,459,592**	**7,306,420**	**7,306,420**	**7,306,420**	**7,306,420**	**7,306,420**	**7,306,420**
Shareholders' equity											
Paid-up capital	19,070,654	19,070,654	19,070,654	19,070,654	19,070,654	19,070,654	19,070,654	19,070,654	19,070,654	19,070,654	19,070,654
Retained earnings	-	(399,495)	14,029,009	21,974,392	42,141,178	57,290,073	83,636,719	108,879,039	141,578,367	179,261,995	218,964,304
Total Equity	**19,070,654**	**18,671,158**	**33,099,663**	**41,045,045**	**61,211,831**	**76,360,727**	**102,707,373**	**127,949,692**	**160,649,020**	**198,332,648**	**238,034,958**
TOTAL CAPITAL AND LIABILITIES	**38,141,307**	**36,861,002**	**43,615,667**	**50,572,390**	**69,671,424**	**83,667,146**	**110,013,792**	**135,256,112**	**167,955,440**	**205,639,068**	**245,341,377**

10.3 Projected Cash Flow Statement

Statement Summaries **SMEDA**

Cash Flow Statement

Rs. in actuals

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Operating activities											
Net profit	-	(399,495)	14,428,505	7,945,382	20,166,786	15,148,895	26,346,646	25,242,320	32,699,328	37,683,628	39,702,309
Amortization (Pre-operational Expenses)	-	202,460	202,460	202,460	202,460	202,460	-	-	-	-	-
Depreciation	-	2,377,670	2,377,670	2,377,670	2,377,670	2,377,670	2,377,670	2,377,670	2,377,670	2,377,670	2,377,670
Accounts receivable	-	(799,825)	(488,099)	256,456	(461,251)	172,407	(406,418)	41,747	(308,213)	(151,394)	(143,084)
Stocks-RM	(6,791,607)	-	(943,122)	2,538,190	(3,191,551)	2,526,346	(3,261,495)	2,514,520	(3,296,198)	2,457,678	(3,292,471)
Accounts payable	-	-	-	-	-	-	-	-	-	-	-
Cash provided by operations	(6,791,607)	1,380,810	15,577,414	13,320,159	19,094,114	20,427,778	25,056,403	30,176,256	31,472,587	42,367,582	38,644,424
Financing activities											
Long term debt principal repayment	-	(847,616)	(915,426)	(988,660)	(1,067,752)	(1,153,173)	-	-	-	-	-
Addition to long term debt	12,279,046	-	-	-	-	-	-	-	-	-	-
Repayment of Running Finance	-	(6,791,607)	(6,758,414)	-	-	-	-	-	-	-	-
Issuance of share	19,070,654	-	-	-	-	-	-	-	-	-	-
Cash provided by / (used for) financing activitie	31,349,700	(7,639,224)	(7,673,839)	(988,660)	(1,067,752)	(1,153,173)	-	-	-	-	-
Investing activities											
Capital expenditure	(31,349,700)	-	-	-	-	-	-	-	-	-	-
Cash (used for) / provided by investing activitie	(31,349,700)	-	-	-	-	-	-	-	-	-	-
NET CASH	**(6,791,607)**	**(6,258,414)**	**7,903,575**	**12,331,499**	**18,026,362**	**19,274,606**	**25,056,403**	**30,176,256**	**31,472,587**	**42,367,582**	**38,644,424**

11 KEY ASSUMPTIONS

Table 11-1: Financial Assumptions

Project life (years)	10
Debt Equity ratio	50:50
Interest rate on short term debt	16%
Interest rate on long term debt	16%
Debt tenure (years)	5
Debt payments per year	2

Table 11-2: Revenue Assumptions

No. of Birds per Flock	30,000
No. of eggs laid/layer/month	26
No. of eggs laid/layer/month (in dozen)	2.15
Culled Birds Sale price (Rs)	105
Selling price (Rs Per Dozen)	85
Manure Sales per Truck	35,000
Minimum Cash balance required (Rs)	500,000

Table 11-3: Expense Assumptions

Vaccination cost per bird (Rs)	8
Brooding Expense/Bird/rearing period (Rs)	7
Fumigation Cost	40,000
DOC (Day old Chicks) Price (Rs)	72
Feed Cost/Bag (Rs)	1,650
Cost of feed/bird/month(rearing period)	Rs. 48
Cost of feed/bird/month(Laying period)	Rs. 95.36

Table 11-4: Economy-Related Assumptions

Amortization Rate for Pre Operations	20%
Sales Price G. Rate	10%
Electricity Growth Rate	10%
Increase in Pay Roll	10%
Price of Raw material Growth Rate	5%

12 ANNEXURE

12.1 Contacts of Machinery, Feed and Day Old Chicks Suppliers

Machinery & Day Old Chick Suppliers	Feed Suppliers
C & K Poultry Equipments Kamboh Brothers Poultry, Grain Market, Samundari. Ph: +92-41-3420581, Fax: +92-41-3423581 (Haji Muhammad Ashraf Cell: +92-333-6881166)	**Big feed Pvt. Limited (Lahore)** 2-A- Ahmed Block new garden town, Lahore Ph: +92-42-35835373-4, Fax: +92-42-35835371
	National Feeds Pvt. Limited 171-II- Shadman, Lahore Ph: +92-42-37551405-8, Fax: +92-42-37573045

12.2 Ten Years Schedule for Rearing and Laying

Rearing Fumigation etc.
Laying

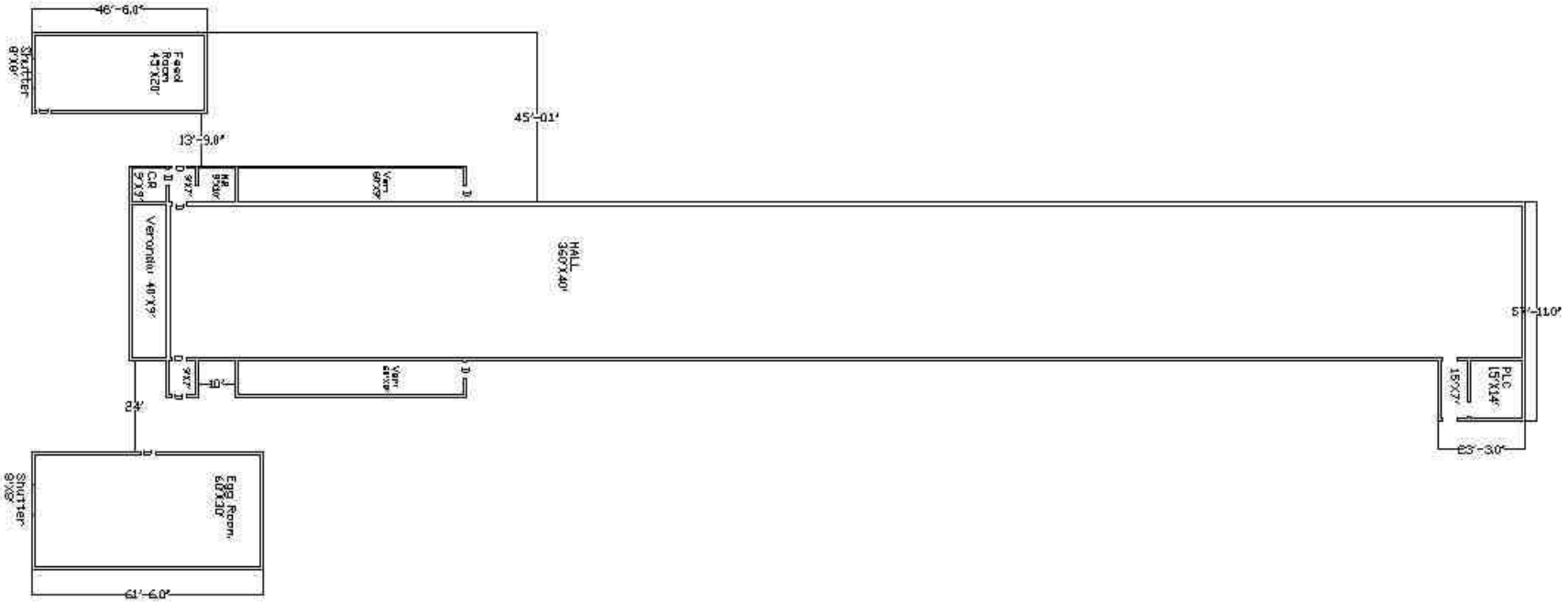
Years	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
1	30	31	31	30	4 27	30	31	31	28	31	30	31
2	30	31	31	30	31	30	31	31	28	31	30	15 16
3	30	31	31	18 12	31	30	31	31	28	31	30	31
4	30	31	31	30	31	30	31	31	28	31	15 15	31
5	30	31	31	3 27	31	30	31	31	28	31	30	31
6	30	31	31	30	31	30	31	31	28	31	15 15	31
7	30	31	19 12	30	31	30	31	31	28	31	30	31
8	30	31	31	30	31	30	31	31	28	16 15	30	31
9	30	31	4 27	30	31	30	31	31	28	31	30	31
10	30	31	31	30	31	30	31	31	28	15 16	30	31

12.3 Machinery & Equipment Detail

Sr. No	Description	Material Description	Amount in Rs.
1	**Wire Structure**		
1.1	G.1 Wire for Side Partition	12 No. SWG	
1.2	G.1 Wire for Center Partition	12 No. SWG	
1.3	G.1 Wire for Floor	12 No. SWG	
1.4	G.1 Wire for Door	6 No. SWG	
1.5	G.1 Wire for Floor Support	10 No. SWG	
2	**Sheet Structure**		
2.1	G.1 Sheet for Single "V"	17 No. SWG	
2.2	G.1 Sheet for Double "V"	20 No. SWG	
2.3	G.1 Sheet for Pillar	17 No. SWG	
2.4	G.1 Plate for fixture of Water system	20No. SWG	
2.5	G.1 Plate for fixture of Feed	14 No. SWG	
2.6	G.1 Plate for Cage Partition	20 No. SWG	
2.7	G.1 Plate for Saddle (Paidan)	26 No. SWG	
2.8	G.1 Sheet for Feed Tray	20 No. SWG	
3	**Feeding System**		
3.1	G.1 Sheet for Feed Trolley	20 No. SWG	
3.2	G.1 Pipe for Traveling of Feed Trolley	17 No. SWG	
3.3	Motor for Feed Trolley (for each)	1-HP	
3.4	Power Cable for Feed Motor	1 mm2,3-Core	
3.5	Wheel for Feed Trolley	Teflon	
3.6	Pipe for Feed Trolley	10 No. SWG	
3.7	Verm for Feed to Trolleys from Feed Room	Italian	
4	**Drinking System**		
4.1	Nipples for Drinking water	Stainless Steel	
4.2	"V" Through	Plastic	
5	**Manure Removal System**		
5.1	Elevator for Manure Removal from Hall		
5.2	Manure Belt	1mm2 thick	
5.3	Manure Belt Drive System		
5.4	Motor for Manure Belt Drive	2HP, 3HP	
6	**Heating System**		

6.1	Diesel Heaters		
7	**Ventilation System**		
7.1	Fans (Europeans)	50"	
7.2	Fans (Europeans)	36"	
7.3	Cooling Pads	Europeans	
7.4	Pad Fitting Material	Stainless Steel or Plastic	
7.5	Automation for Fans	Controlled by PLC	
7.6	Water Pumps for Showering	As per Requirement	
7.7	Automation for Pumps	Controlled by PLC	
7.8	Power Cables for Pumps	As per Requirement	
7.9	Power Cables for Fans	As per Requirement	
7.10	Air Inlet	As per Requirement	
7.11	Light System		
7.12	Power Cables for Lights	As per Requirement	
8	**Electrical System**		
8.1	Control Panel for Feed System	As per Requirement	
8.2	Control Panel for Ventilation	As per Requirement	
8.3	Control Panel for Lights	As per Requirement	
8.4	Cable Tray for Wiring	As per Requirement	
9	**Fitting Material**		
9.1	Screws	As per Requirement	
9.2	Nut Screws	As per Requirement	
9.3	Nail & Bolts	As per Requirement	
9.4	Cage Foot	As per Requirement	
9.5	Boot for Foot	As per Requirement	
9.6	Hangers for Partition	As per Requirement	
9.7	Inspection Trolley		
Total Cost of Machinery			**16,500,000**

12.4 Farm layout



12.5 Pictures of Layer Farms