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# Pre-Feasibility Study

## QUAIL BREEDER FARM & HATCHERY



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## 1 DISCLAIMER

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## 2 EXECUTIVE SUMMARY

The Quail Breeder Farm and Hatchery Unit is a project of the livestock sector, which aims to serve the poultry sector's quail bird demand in Pakistan. An exclusive quail market segment has lately been growing within the poultry meat sector, particularly to cater to health conscious meat consumers.

This project is assumed to purchase quail breeder birds and rear under specific conditions for laying eggs. The fertilized eggs would then be artificially incubated in a setter / incubator for 15 days and then placed in hatcher for 3 days for hatching process. At the end of this 18-day incubation period, quail eggs hatch to produce day old chicks (DOC). These DOCs will be sold to quail meat farmers who demand DOCs for raising and slaughtering to sell in the meat markets.

A hatchery unit of incubating / breeding around 1.70 million quail eggs per annum is suggested in this pre-feasibility study as a viable economic size to enter in this business. One hatchery machine, along with one incubator having 45,000 eggs incubating capacity along with 15,000 eggs hatching capacity are proposed in the project. The project is based on the capacity of the hatchery unit that is 15,000 eggs per batch. However, unit is estimated to operate at 60% capacity in the initial year and with 5% gradual increase will attain the maximum capacity utilization of 100%.

The total initial cost for setting up the proposed size quail breeder farm and hatchery unit is estimated at Rs. 11.15 million. The project is proposed to be financed through 50% debt and 50% equity. The project NPV is projected around Rs. 17.99 million, with an IRR of 47% and a payback period of 2.84 years. The legal business status of this project is proposed as 'Sole Proprietorship'.

About, 6 personnel would be required to manage the operations of the setup, including the owner manager. Quail breeder management according to best husbandry practices is the key success factor for this business. All operations should be done in strict compliance with recommended husbandry practices including the standard of hygiene, proper temperature, humidity, vaccination, medication, and feeding and lighting management.

## 3 INTRODUCTION TO SMEDA

The Small and Medium Enterprises Development Authority (SMEDA) was established in October 1998 with an objective to provide fresh impetus to the economy through development of Small and Medium Enterprises (SMEs).

With a mission "to assist in employment generation and value addition to the national income, through development of the SME sector, by helping increase the number, scale and competitiveness of SMEs", SMEDA has carried out 'sectoral research' to identify policy, access to finance, business development services, strategic initiatives and institutional collaboration and networking initiatives.

Preparation and dissemination of prefeasibility studies in key areas of investment has been a successful hallmark of SME facilitation by SMEDA.

Concurrent to the prefeasibility studies, a broad spectrum of business development services is also offered to the SMEs by SMEDA. These services include identification of experts and consultants and delivery of need based capacity building programs of different types in addition to business guidance through help desk services.

#### **4 PURPOSE OF THE DOCUMENT**

The objective of the pre-feasibility study is primarily to facilitate potential entrepreneurs in project identification for investment. The project pre-feasibility may form the basis of an important investment decision and in order to serve this objective, the document / study covers various aspects of project concept development, start-up, and production, marketing, finance and business management.

The purpose of this document is to facilitate potential investors in **Quail Breeder Farm and Hatchery** by providing them with a general understanding of the business with the intention of supporting potential investors in crucial investment decisions.

The need to come up with pre-feasibility reports for undocumented or minimally documented sectors attains greater imminence as the research that precedes such reports reveal certain thumb rules; best practices developed by existing enterprises by trial and error, and certain industrial norms that become a guiding source regarding various aspects of business set-up and its successful management.

Apart from carefully studying the whole document one must consider critical aspects provided later on, which form basis of any Investment Decision.

#### **5 BRIEF DESCRIPTION OF PROJECT & PRODUCT**

The Quail Breeder Farm and Hatchery is a project of the livestock sector, in which day old chicks (DOCs) are produced from fertilized eggs of quail breeders reared on the farm. The unit is proposed to cater to the demand of quail meat farmers for

production of DOCs. Quail breeder flock would be bought and reared on the farm and their fertilized eggs artificially incubated for 18 days in a Hatchery machine on the same premises to produce DOCs. These DOCs are sold to farmers in rural and peri-urban areas directly as there is an increasing trend to include quail meat in diet as rich source of protein.

The proposed project initiates with the purchase of around 4,714 quail breeders in year one, having 30% (1,414) male and 70% (3,300) female quail birds. This size of female quail is increased at a rate of 5% every year going up to 5,500 female quail breeders in year 9 with 100% capacity. The eggs produced would be placed in the hatchery machine batch-wise. A total of 121 batches are assumed per year, these batches will be placed in the hatchery machine every 3 days. The size of the batch would increase with the size of the breeder flock.

The breeder flock would be purchased according to the required egg production per batch. In first year, the proposed breeder flock would lay eggs that fulfil 60% of the total capacity; the remaining 40% of the hatchery machines' capacity would be rented out to other farmers who require incubation services. The numbers of eggs produced in year one is 1,023,825 eggs laid by 3300 female birds. The production of eggs would be increased by increasing the size of the breeder flock at a rate of 5% every year would eventually utilize 100% egg capacity of the hatchery machines and rental services would no longer be offered. After 18 days of incubation of fertilized eggs DOCs will be produced; these DOCs would be sold immediately to farmers.

The specific requirement of temperature and humidity control in hatchery and feeding, drinking and lighting system for breeder flock would be monitored regularly. After every 12 months, new breeder stock would be reared to produce continuous supply of fertilized eggs. The previous breeder flock would be sold to farmers for slaughtering. Two days would be spent in proper cleaning, washing, white washing, disinfection and fumigation prior to the arrival of new flock. During flock rearing, strict measures for bio-security should be observed at the unit.

## **5.1 Product Mix**

This project would generate revenue from sale of day old quail chicks weighing between 6-8 grams at Rs. 10 per DOC. Moreover, hatchery rental facility would be provided in the first four years at a rate of Rs. 1.5 per egg.

Additional revenues will be generated through the sale of adult breeders at the end of 12 months egg laying period.

## 5.2 Installed and Operational Capacities

The installed and operational capacities of Quail Breeder Farm and Hatchery business venture mainly depends on the acquired hatcher unit and breeding incubators. This pre-feasibility study is based on a hatchery machine having 45,000 eggs incubating capacity along with 15,000 eggs hatching capacity.

However, initial operating capacity during first year is worked out at 60% with a gradual increase of 5% up to maximum capacity utilization of 100% in the 9<sup>th</sup> year. This production capacity is estimated to be economically viable and justifies the capital as well as operational costs of the project.

The details of operational and installed capacities according to product mix are provided in the table below:

**Table 1: Installed and Operational Capacities**

Description	Percent's	Unit	Year 1 Capacity (60%)	Maximum Capacity (100%)
Female Breeders Purchased		No of Birds	3,300	5,500
<b>BREEDING</b>				
Male Birds	30%	No of Birds	1,414	2,357
Female breeders	70%	No of Birds	3,300	5,500
Total			4,714	7,857
<b>EGG PRODUCTION</b>				
Egg Production	85%	No of Eggs	1,023,825	1,706,375
Batches		No	121	121
Eggs per Batch		No of Eggs	8,415	14,025
Total Eggs Placed in Hatchery		No of Eggs	1,018,215	1,697,025
<b>HATCHERY</b>				
Capacity	100%	No of Eggs	15,000	15,000
Eggs Placed in Hatcher per Batch		No of Eggs	8,415	14,025
Time Required per Batch		Days	18	18
Hatchability	90%	of Total Eggs		
DOCs Produced per Batch		No	7,573	12,622
DOCs Produced in Year		No	916,333	1,527,262
<b>HATCHERY SERVICE</b>				
Eggs Placed in Hatchery		No of Eggs	796,785	117,975

## 6 FARM OPERATIONS AND PROCESSES MANAGEMENT

Farm input required for the proposed project includes farm equipment (cages, hatchery unit, egg refrigerators etc.), electronic fixtures and other consumer items (feed, vaccines & medicines, clean drinking water, electricity etc.). The quail birds would be settled in cages, which are equipped with a proper feeding and nipple drinking system, monitored by the concerned staff.

After one year, a gap of 2 days is required for the preparation of farm to receive the new flock. During these days, proper cleaning, washing, disinfection and fumigation would be performed prior to the arrival of new flock. During flock rearing, strict measures for bio-security should be observed at the unit.

### 6.1 Housing and Management of Quail Breeders

Housing would be a cage system. The cages would be kept in closed farms. A concrete floor is essential, and the building should be fulfilling basic requirements, not only to deter rodents and other pests but also to provide drought-free and well-ventilated, sheltered accommodation. Canvas-cloth is sometimes hanged over on both sides of the house to prevent direct sunlight into the cages. The quails should not be exposed to direct sunlight.

A 5-tier high cage system is required. Each unit is about 6 feet in length and 1 foot in width, and subdivided into 5 subunits. The birds stand on sloping slatted wire mesh floors. The droppings fall into pull out trays / conveyor belt. Front and back side of cages are closed by slats. Long narrow feed troughs are placed in front of the cages and PPC water troughs are placed at the back of the cages. The eggs roll out under the feed troughs and are collected twice daily, once in the morning and once in the evening.

Commercial egg layers are usually housed in colonies of 10-12 birds per cage. For breeding purposes, male quails are introduced in the cages in the ratio of 1 to 3 females. In Egg Production, cage specifications are very important for maximum production.

#### Lighting Management

It has been proven through experiments that light has more importance than temperature in stimulating quails to lay eggs. A dim light is enough to maintain wakefulness and social activity in the flock. Electric bulbs of 40 or 60 watts may be used in colony pens.

For the light to be effective it must be turned on before dark and calculated to go off after the day has been extended to 14 or 16 hours. Control of the light may be by a time switch.



### Practical Feeding

Nutrition is one of the most important factors required to maintain quails in good physical condition and to obtain normal growth and egg production. Since feed constitutes 60-70% investment at the farm, for deriving maximum benefit out of quail farming it is necessary to feed a balanced ration, which will have all the nutrients in necessary proportion. There are several forms in which a balanced ration may be fed to quail, i.e. all dry mash, pellets or crumbs. In tropics usually dry all mash feeding system is being used.

The local farmers may use the quail starter and layer diets for their growing and laying quails and supplement them with high protein ingredients, such as soybean meal and skimmed milk. Fast early growth is achieved with high-protein diets. Normally quails, which mature at 5 to 6 weeks of age, respond favorably to higher dietary protein concentration. The feed required up to 6 weeks of age is about 500 gram per chick, and thereafter it is about 30 gram per bird per day.

During the laying period, birds require about 3 kg of feed per kilogram of eggs at maximum. For birds just prior to maturity, the dietary requirements are similar, except for calcium and phosphorus. A diet containing 1.25 percent total phosphorus and 3.50 percent calcium is recommended; this may need to be increased to 3.9 percent. In hot weather when quails eat less food but still require calcium to maintain egg production, broken oyster-shell or limestone grits may be given ad lib. It is better to give high protein and high vitamin feed during summer. Feeding should be done during the cooler parts of the day to promote feed consumption.

It is important to obtain fresh feed and it should be stored in covered containers with tight fitting lids in a clean, dry, cool area free from animals and vermin. Feed stored longer than 8 weeks is subject to vitamin deterioration and rancidity, especially in hot humid tropics.

### Disease Prevention and Control

The prevention of disease in quail depends on continuous and conscientious application of fundamental principles and practices of quarantine and sanitation. Although, they are comparatively more resistant to infectious diseases than chickens yet may be affected from diseases, such as, Fowl Cholera, Coli-bacillosis, Enteritis and Mycotoxicosis. Majority of breeder bird deaths (up to even 20-25 percent) occur due to managerial errors, especially the failure to provide optimum temperature in extreme weathers, improper feeding and watering management etc. Good management will reduce the danger of disease.

The first prerequisite to a successful disease-prevention program is that infection-free stock be used as the foundation flock. Immediately on arrival, the birds should be placed in facilities well isolated from birds of the farms and held for an observation period of 2 weeks. They should be observed daily for signs of illness, and when disease is noted, immediate steps should be taken to obtain a diagnosis, and treatment be given. The second rule is to separate quail breeder flocks from other quail.

Sanitary management practices are the best guarantee against disease. Equipment, such as cages, feeders, water drinkers and tools should be cleaned and sanitized frequently. Every effort should be made to screen out wild birds, rodents and vermin that might introduce disease. Dead birds should be removed immediately upon discovery. Proper management of quail chicks, disinfecting farm premises, providing clean drinking water and feeding quality concentrate feed will prevent disease outbreaks in quail farms.

## 6.2 Incubation Process

### Pre-incubation Egg Care

Successful quail propagation begins in the pre-incubation period. Eggs should be collected twice daily and more frequently in hot weather. Special care must be taken in collection and handling of quail eggs for they are thin-shelled and break more easily than chicken eggs. If egg collection is delayed, the eggshells may crack or get damaged because of the frequently moving and active birds. Japanese quail eggs can be stored at room temperature for 5-7 days during normal seasons.

Eggs should be of a uniform size as extremely large or small sized eggs have low hatchability. Eggs held for incubation should be kept in a cool, clean, dust-free room at a temperature of  $14 \pm 3^{\circ}\text{C}$  ( $55 \pm 5^{\circ}\text{F}$ ) and  $70 \pm 10$  percent relative humidity. Eggs should be stored large end up and they should not be held for more than 12-14 days before being placed in the incubator. The eggs set in the incubator must be clean. Eggs to be incubated should not be washed; if cleaning is required, it should be done with a clean abrasive or sandpaper. The egg is mostly water and quail egg dehydrates more rapidly. Eggs stored in PVC bags may be stored for a longer period of time (14-21 days) and the hatchability rate would be higher than unpackaged eggs stored in low temperature.

### Artificial Incubation

Quail eggs can be incubated successfully in standard size commercial incubators. Quail eggs will hatch successfully if they are placed in an incubator

in any position except with the large end down. The incubator should have a fan to provide adequate air circulation because the developing embryos use oxygen and give off carbon dioxide and heat. Little ventilation is needed at the beginning but the requirement increases as incubation progresses. The machine should be equipped to allow automatic turning of all eggs through an angle of 90 at least 4-6 times per 24 hours. Turning regularly is particularly critical in early incubation to prevent the embryos from adhering to the shell membrane. Lack of turning during the first 3 to 4 days will produce some malformed embryos and may have other minor defects. Turning may be discontinued after 14 days.

Fan-ventilation incubators should be set at  $37.5 + 0.3$  °C. If the temperature of the incubator exceeds these recommendations many embryos may die. During the hatching period temperature should be lowered 0.5 °C. A relative humidity of about 60 percent is satisfactory during incubation and should be raised to about 70 percent during the hatching period. The incubation period is 16 1/2 to 18 days and may range from 16 to 18 days depending upon temperature, humidity and genetic variability. The developing eggs may be transferred to a separate hatcher on 15th day of incubation. It takes 10 hours from piping to hatch, and an additional 5 hours for drying the chick. Then the quail chicks are ready to be distributed to other farmers or to go into the brooder for rearing.

#### Automatic Incubator / Hatchery Controller

The latest microprocessor technology is employed in incubator controller system with high intelligence and measurement accuracy ( $\pm 0.1$  °C). During the process of incubation, the controller automatically does temperature control, over-temperature alarm and egg turning. The control panel is easy to operate.

## **7 CRITICAL FACTORS**

The commercial viability of the proposed quail breeder farm and hatchery depends on the following critical factors:

- ⇒ Technical know-how, relevant expertise and experience of entrepreneur.
- ⇒ Higher return on investment and a steady growth of business is closely associated with regular training and capacity building of the entrepreneur and employees.
- ⇒ Selection of appropriate machinery, farm equipment and technology would be required to run project successfully.
- ⇒ Selection of high quality quail breeder birds.

- ⇒ The farm supervisor should ensure timely feeding, watering, lighting, vaccination, medication, temperature / humidity control and culling of uneconomical layers as per best husbandry practices to ensure flock's best performance and higher efficiency.
- ⇒ Sanitation and disinfection program strictly followed during and after the completion of one-year cycle. Automatic drinkers and feeders should be checked on regular basis for the functioning.
- ⇒ Quail breeders should be given enough space according to their age as less space could give rise to different complexities.
- ⇒ Feed should not be stored for long time as it would lose its nutrition and there is a chance that feed would get fungal and can prove to be poisonous to quail chicks.
- ⇒ On quail farm it should be strictly prohibited for employees to keep free range chickens or any other bird so that disease spread is avoided.
- ⇒ The entrepreneur should be well aware of the supply and demand of eggs in the market.

## **8 GEOGRAPHICAL POTENTIAL FOR INVESTMENT**

Rural and peri-urban areas around the major cities, particularly of the Punjab and Sindh province are the most suitable locations for setting up a quail breeder farm and hatchery unit. Setting up a farm at an isolated place will minimize the risk of disease. Proximity of the unit 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 and culled birds.

Presently, major demand of quail bird in Pakistan originates from Multan, Lahore, Karachi, Gujranwala and Islamabad.

Therefore, sub-urban and rural areas around big cities e.g. Rawalpindi, Lahore, Multan, Karachi, Hyderabad, Sukkur, Bahawalpur, Gujranwala, Sahiwal, Jehlum, Peshawar, Hub / Lasbela and other big cities of the country are recommended for starting a layer farm particularly with milder climate.

## **9 POTENTIAL TARGET CUSTOMERS / MARKETS**

Quail meat is a good source of animal protein available in the country as compared to broiler. Quails are sold to traders and whole seller markets in urban areas. Quail meat is also sold directly to hotels and restaurants around the country. The time required for rearing quail birds is lesser than that for large

animals or broilers. Also, the consumption of white meat is increasing due to growing health consciousness in masses. In summer consumption is less and in winter consumption is more.

Major target market for the proposed project is local market. Sale of quail bird is generally made through dealer contracts on farm gate basis or supplies to bulk / retailer buyers in urban areas. Major clients are Super Stores, Food Street, Meat Markets, Restaurants and Hotels (including various 3 to 5 Star Hotel Chains) across the country.

## 10 PROJECT COST SUMMARY

### 10.1 Project Economics

All the figures in this financial model have been calculated for estimated sales of Rs. 10.55 million in the year one. The capacity utilization during year one is worked out at 60% with 5% increase in subsequent years up to the maximum capacity utilization of 100%.

The following table shows Internal Rate of Return, Payback Period and Net Present Value of the proposed venture.

**Table 2: Project Economics**

Description	Details
Internal Rate of Return (IRR)	47%
Payback Period (Yrs.)	2.84
Net Present Value (Rs.)	17,990,117

### 10.2 Project Financing

Following table provides details of the equity required and variables related to bank loan:

**Table 3: Project Financing**

Description	Details
Total Equity (50%)	Rs. 5,577,865
Bank Loan (50%)	Rs. 5,577,865
Mark-up to the Borrower (%age / annum)	14%
Tenure of the Loan (Years)	5 Years

### 10.3 Project Cost

Following fixed and working capital requirements have been identified for operations of the proposed business.

**Table 4: Project Cost**

Description	Amount Rs.
<b>Capital Cost</b>	
Machinery & Equipment	7,661,429
Furniture & Fixture	197,800
Office Vehicle	729,840
Office Equipment	94,000
Pre-Operating Cost	202,303
Training Cost	50,000
<b>Total Capital Cost</b>	<b>8,935,372</b>
<b>Working Capital</b>	
Equipment Spare Part Inventory	6,385
Raw Material Inventory	625,869
Upfront Building Rent	480,000
Cash	1,108,105
<b>Total Working Capital</b>	<b>2,220,359</b>
<b>Total Project Cost</b>	<b>11,155,731</b>

### 10.4 Space Requirement

Approximately 3,582 sq. feet (i.e. 16 Marlas) would be required for setting up the proposed unit. It is suggested that, required land should be acquired in the suburbs or rural areas nearby to the major cities on rental basis. However, keeping future expansion in mind the entrepreneur may start the project on purchased land.

The infrastructural and area requirements details of the project are provided in the table below:

**Table 5: Space Requirement**

Description of Covered Area	Area (Sq ft)
<b>Admin Block</b>	
Office	300
Guard Room	80
Washroom	144

<b>Breeding Sheds</b>	
Hall	1,500
Cold Room for Egg Storage	350
Hatchery (Incubator and Setter)	648
Store (Feed & Equipment)	360
Open Area	200
<b>Total</b>	<b>3,582</b>

The rent assumed in this pre-feasibility is around Rs. 40,000 per month.

Decisions made about setting up a Quail farming unit needs to be well thought out, right from the selection of the site to the final stages when the birds are sold. The farm should be located at a place where transportation of birds and feed can be handled easily.

The entrepreneur should make sure that the following things are available at the farm site before setting up the farm:

- i. Electricity Connection
- ii. Clean Water Supply

### 10.5 Machinery & Equipment Requirement

Various types of farm equipment are needed for feeding, drinking, handling the birds and for egg artificial incubation and hatching process. List of farm machinery and equipment required for the proposed project are stated below:

**Table 6: Machinery & Equipment Requirement**

Description	Unit	Unit Cost (Rs.)	Total Amount (Rs.)
<b>Breeding &amp; Raising</b>			
Fiber Sheet Battery A4 Tier Cages Per Bird Cost (Incl. Drinkers, Feeders etc.)	7,857	200	1,571,429
Chiller Standing Air Conditioner 4 Tons Capacity	1	175,000	175,000
Air Coolers	4	15,000	60,000
<b>Sub Total</b>			<b>1,806,429</b>
<b>Egg Cold Storage Room for Eggs</b>			
Automatic Turning Trolley for Eggs (Thermostat, Electronic Motor, Timer)	1	300,000	300,000

Chiller Standing Air Conditioner 4 Tons Capacity (Orient)	1	175,000	175,000
<b>Sub Total</b>			<b>475,000</b>
<b>Hatchery</b>			
Incubator Automatic Humidity Control (45,000 Eggs Capacity)	1	3,150,000	3,150,000
Hatchery Machine (15,000 Eggs Capacity)	1	1,000,000	1,000,000
Generator 20 KVA- DENYO	1	1,080,000	1,080,000
Misc. Equipment (Egg Trays, Chick Boxes)		100,000	100,000
Egg Storage Refrigerator	1	50,000	50,000
<b>Total Hatchery</b>			<b>5,380,000</b>
<b>Total Machinery Cost</b>			<b>7,661,429</b>

### 10.6 Furniture & Fixtures Requirement

Details of the furniture and fixture required for the project are given below:

**Table 7: Furniture & Fixture Requirement**

Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Tables	2	10,000	20,000
Chairs	4	2,500	10,000
Sofa Set For Office	1	25,000	25,000
Misc. Furniture	1	15,000	15,000
Ceiling Fans	4	3,000	12,000
Lighting	236	300	70,800
Exhaust Fans	6	5,000	30,000
Signboard Outside Shed	1	15,000	15,000
<b>Total</b>			<b>197,800</b>

### 10.7 Office Equipment Requirement

Following office equipment is required for this project:



**Table 8: Office Equipment Requirement**

Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Computers	1	35,000	35,000
UPS for Office	1	40,000	40,000
Computer printer (s)	1	15,000	15,000
Telephones	2	2,000	4,000
<b>Total</b>			<b>94,000</b>

**10.8 Vehicle Requirement**

Vehicle requirement for transport of quail breeder and DOCs to and from the farm is given in the table below:

**Table 9: Vehicle Requirement**

Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Suzuki Ravi	1	642,000	642,000
Car Body Work			75,000
Registration Fee			12,840
<b>Total</b>			<b>729,840</b>

**10.9 Raw Material Requirement**

Following table shows raw material requirement to raise 5,000 layers per flock. The mortality loss is assumed to be 5 % of overall flock. The capacity utilization at layer farm in first year would be 100%.

**Table 10: Raw Material Requirement**

Description	Qty.	Unit Rate (Rs.)	Cost in 1 <sup>st</sup> Year (Rs.)
Purchase of Breeder Birds	4,761 Birds	65	309,493
Feed Cost	1,164 Bags	2,150	2,503,476*
Vaccination. Medication and Disinfection	4,761 Birds	5	23,807*
<b>Total</b>			<b>2,836,776</b>

\*Difference is due to rounding off.

### 10.10 Human Resource Requirement

In order to run operations of proposed unit smoothly, details of human resources required along with monthly salary are recommended as under:

**Table 11: Human Resource Requirement**

Description	Number of Personnel	Monthly Salary / Person (Rs.)	Annual Salaries (Rs.)
Farm Manager	1	25,000	300,000
Labor - Breeding	1	15,000	180,000
Labor - Hatchery	1	16,500	198,000
Driver	1	15,000	180,000
Guard	1	13,000	156,000
Sweeper	1	13,000	156,000
<b>Total</b>	<b>6</b>		<b>1,170,000</b>

### 10.11 Utilities and Other Costs

An essential cost to be borne by the project is the cost of electricity and water, which are estimated to be Rs. 857,070 and Rs. 60,000 respectively in the first year of operations. The promotional expense being essential for marketing of 'Quail Breeder Farm and Hatchery' unit is estimated as 5% of cost of sales expenses i.e. Rs. 527,354. Furthermore, travelling expenses are assumed as Rs. 316,412 per annum, while vehicle maintenance cost is worked out as Rs. 120,000.

### 10.12 Revenue Generation

Based on the 60% capacity utilization, sales revenue during the first year of operations is estimated as under:

**Table 12: Revenue Generation – Year 1**

Description	Total Unit in Year 1	Sale Price per Unit (Rs.)	Revenue Generation
DOCs	916,333	10.00	9,163,330
Breeder	4,714	40	188,571
Outside Eggs Placed in Hatchery	796,785	1.50	1,195,178
<b>Total Revenue</b>			<b>10,547,079</b>

## 11 CONTACT DETAILS

In order to facilitate potential investors, contact details of machinery suppliers and technical experts is provided below:

### 11.1 Technical Experts

Name	Address	Tel / Mob
Prof. Dr. Muhammad Akram (Project Director)	Avian Research & Training (ART) Centre, Uni. Of Vet. & Animal Sciences (UVAS), 23 Km, Ferozpur Road, Lhr.	0300-4238270
Dr. Jibran Hussain (Lecturer/ Farm Manager)	Avian Research & Training (ART) Centre, Uni. Of Vet. & Animal Sciences (UVAS), 23 Km, Ferozpur Road, Lhr	0301-700 8767
Dr. Fazal Ahmad (Farm Owner)	Nizam Poultry Breeding Farms and Hatchery Canal Road, Bridge Crossing Ring Road, Harbanspura, Lahore	0423-6544865

### 11.2 Machinery Suppliers

Company Name	Address	Tel / Mob
Rayvet Incorporation (Mr. Hanif Rajput)	Lahore	0333-4211435
C & K Poultry Equipment's	Kamboh Brothers Poultry, Grain Market, Samundri Faisalabad.	041-3420581
Neela Quail Breeding Farm & Hatchery (Mr. Kaleem)	Joda Pull, Lahore	0321-4664093

## 12 USEFUL WEB LINKS

Small & Medium Enterprises Development Authority (SMEDA)	<a href="http://www.smeda.org.pk">www.smeda.org.pk</a>
Government of Pakistan	<a href="http://www.pakistan.gov.pk">www.pakistan.gov.pk</a>
Ministry of Industries & Production	<a href="http://www.moip.gov.pk">www.moip.gov.pk</a>

Government of Punjab	<a href="http://www.punjab.gov.pk">www.punjab.gov.pk</a>
Government of Sindh	<a href="http://www.sindh.gov.pk">www.sindh.gov.pk</a>
Government of Khyber Pakhtunkhwa	<a href="http://www.khyberpakhtunkhwa.gov.pk">www.khyberpakhtunkhwa.gov.pk</a>
Government of Balochistan	<a href="http://www.balochistan.gov.pk">www.balochistan.gov.pk</a>
Government of Gilgit Baltistan	<a href="http://www.gilgitbaltistan.gov.pk">www.gilgitbaltistan.gov.pk</a>
Government of Azad Jamu Kashmir	<a href="http://www.ajk.gov.pk">www.ajk.gov.pk</a>
Trade Development Authority of Pakistan (TDAP)	<a href="http://www.tdap.gov.pk">www.tdap.gov.pk</a>
Security Commission of Pakistan (SECP)	<a href="http://www.secp.gov.pk">www.secp.gov.pk</a>
Federation of Pakistan Chambers of Commerce and Industry (FPCCI)	<a href="http://www.fpcci.com.pk">www.fpcci.com.pk</a>
State Bank of Pakistan (SBP)	<a href="http://www.sbp.org.pk">www.sbp.org.pk</a>
Punjab Small Industries Corporation	<a href="http://www.psic.gop.pk">www.psic.gop.pk</a>
Sindh Small Industries Corporation	<a href="http://www.ssic.gos.pk">www.ssic.gos.pk</a>
Punjab Vocational Training Council (PVTC)	<a href="http://www.pvtc.gop.pk">www.pvtc.gop.pk</a>
Technical Education and Vocational Training Authority (TEVTA)	<a href="http://www.tevta.org">www.tevta.org</a>
Punjab Food Authority	<a href="http://www.punjabfoodauthority.gov.pk">www.punjabfoodauthority.gov.pk</a>
Agriculture University Faisalabad	<a href="http://www.uaf.edu.pk">www.uaf.edu.pk</a>
Ministry of National Food Security and Research (MNFS&R)	<a href="http://www.mnfsr.gov.pk">www.mnfsr.gov.pk</a>
University of Veterinary & Animal Sciences, Lahore	<a href="http://www.uvas.edu.pk/">http://www.uvas.edu.pk/</a>
Poultry Association of Pakistan	<a href="http://www.pakistanpoultrycentral.com">www.pakistanpoultrycentral.com</a>
Poultry Research Institute	

## 13 ANNEXURES

### 13.1 Income Statement

Income Statement										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue	10,547,079	12,308,713	14,316,027	16,600,521	19,199,311	22,148,675	25,494,681	29,287,146	33,581,895	36,916,868
<i>Cost of sales</i>										
Adult breeders purchase	309,493	352,048	398,085	447,846	501,587	559,583	622,125	689,522	762,103	800,208
Feed consumption of breeders	2,503,476	2,847,704	3,220,096	3,622,608	4,057,321	4,526,448	5,032,346	5,577,516	6,164,623	6,472,854
Vaccination expense	23,807	28,435	33,761	39,880	46,899	54,937	64,131	74,633	86,613	95,491
Direct labor	378,000	415,800	457,380	503,118	553,430	608,773	669,650	736,615	810,277	891,304
Machinery maintenance	153,229	160,890	168,935	177,381	186,250	195,563	205,341	215,608	226,388	237,708
Direct Electricity	857,070	1,021,341	1,209,897	1,425,950	1,673,114	1,955,452	2,277,527	2,644,462	3,062,008	3,368,209
Direct water & gas	60,000	66,000	72,600	79,860	87,846	96,631	106,294	116,923	128,615	141,477
Generator petrol expense	662,256	789,188	934,885	1,101,828	1,292,812	1,510,974	1,759,840	2,043,370	2,366,008	2,602,608
Total cost of sales	4,947,330	5,681,406	6,495,638	7,398,471	8,399,259	9,508,362	10,737,254	12,098,649	13,606,636	14,609,860
Gross Profit	5,599,749	6,627,307	7,820,390	9,202,050	10,800,052	12,640,314	14,757,427	17,188,498	19,975,259	22,307,007
<i>General administration &amp; selling expenses</i>										
Administration expense	792,000	871,200	958,320	1,054,152	1,159,567	1,275,524	1,403,076	1,543,384	1,697,722	1,867,495
Building rental expense	480,000	528,000	580,800	638,880	702,768	773,045	850,349	935,384	1,028,923	1,131,815
Electricity expense	54,000	59,400	65,340	71,874	79,061	86,968	95,664	105,231	115,754	127,329
Travelling expense	316,412	369,261	429,481	498,016	575,979	664,460	764,840	878,614	1,007,457	1,107,506
Communications expense (phone, fax, mail, internet, etc.)	60,000	63,000	66,150	69,458	72,930	76,577	80,406	84,426	88,647	93,080
Vehicle maintenance expense	120,000	132,000	145,200	159,720	175,692	193,261	212,587	233,846	257,231	282,954
Office expenses (stationary, entertainment, janitorial services, etc.)	118,800	130,680	143,748	158,123	173,935	191,329	210,461	231,508	254,658	280,124
Promotional expense	527,354	474,619	427,157	384,441	345,997	311,397	280,258	252,232	227,009	204,308
Depreciation expense	963,224	963,224	963,224	968,163	968,163	1,057,278	1,062,995	1,062,995	1,062,995	1,069,614
Amortization of pre-operating costs	40,461	40,461	40,461	40,461	40,461	-	-	-	-	-
Amortization of legal, licensing, and training costs	10,000	10,000	10,000	10,000	10,000	-	-	-	-	-
Subtotal	3,482,251	3,641,845	3,829,880	4,053,287	4,304,554	4,629,838	4,960,638	5,327,620	5,740,396	6,164,224
Operating Income	2,117,498	2,985,463	3,990,510	5,148,763	6,495,498	8,010,475	9,796,789	11,860,877	14,234,863	16,142,783
Other income (interest on cash)	79,806	175,257	372,101	645,112	984,572	1,469,638	2,151,073	2,991,522	4,020,213	5,362,827
Gain / (loss) on sale of office equipment	-	-	56,400	-	-	93,490	-	-	122,326	-
Gain / (loss) on sale of office vehicles	-	-	-	-	291,936	-	-	-	-	-
Earnings Before Interest & Taxes	2,197,304	3,160,720	4,419,011	5,793,876	7,772,006	9,573,603	11,947,862	14,852,399	18,377,402	21,505,610
Interest expense on long term debt (Project Loan)	583,972	484,884	370,999	240,107	89,666	-	-	-	-	-
Interest expense on long term debt (Working Capital Loan)	85,978	-	-	-	-	-	-	-	-	-
Subtotal	669,950	484,884	370,999	240,107	89,666	-	-	-	-	-
Earnings Before Tax	1,527,354	2,675,835	4,048,012	5,553,769	7,682,340	9,573,603	11,947,862	14,852,399	18,377,402	21,505,610
Tax	152,971	391,459	736,903	1,188,630	1,911,318	2,573,260	3,404,251	4,420,839	5,654,590	6,749,463
<b>NET PROFIT/(LOSS) AFTER TAX</b>	<b>1,374,384</b>	<b>2,284,377</b>	<b>3,311,108</b>	<b>4,365,139</b>	<b>5,771,022</b>	<b>7,000,343</b>	<b>8,543,611</b>	<b>10,431,560</b>	<b>12,722,812</b>	<b>14,756,147</b>

## 13.2 Balance Sheet

<b>Balance Sheet</b>											
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<b>Assets</b>											
<i>Current assets</i>											
Cash & Bank	1,108,105	1,552,102	4,289,798	8,113,584	13,390,164	19,428,908	29,559,024	42,143,411	57,573,979	76,433,106	102,327,784
Accounts receivable		433,442	469,640	547,084	635,272	735,613	849,616	978,973	1,125,654	1,291,830	1,448,605
Equipment spare part inventory	6,385	7,039	7,760	8,556	9,433	10,400	11,466	12,641	13,937	15,365	-
Raw material inventory	625,869	747,522	887,539	1,048,405	1,232,925	1,444,256	1,685,956	1,962,031	2,276,989	2,510,380	-
Pre-paid building rent	480,000	528,000	580,800	638,880	702,768	773,045	850,349	935,384	1,028,923	1,131,815	-
<b>Total Current Assets</b>	<b>2,220,359</b>	<b>3,268,105</b>	<b>6,235,537</b>	<b>10,356,509</b>	<b>15,970,561</b>	<b>22,392,221</b>	<b>32,956,411</b>	<b>46,032,441</b>	<b>62,019,481</b>	<b>81,382,496</b>	<b>103,776,389</b>
<i>Fixed assets</i>											
Machinery & equipment	7,661,429	6,895,286	6,129,143	5,363,000	4,596,857	3,830,714	3,064,571	2,298,429	1,532,286	766,143	-
Furniture & fixtures	197,800	178,020	158,240	138,460	118,680	98,900	79,120	59,340	39,560	19,780	-
Office vehicles	729,840	583,872	437,904	291,936	145,968	1,175,415	940,332	705,249	470,166	235,083	-
Office equipment	94,000	62,667	31,333	108,817	72,545	36,272	125,969	83,979	41,990	145,825	97,217
<b>Total Fixed Assets</b>	<b>8,683,069</b>	<b>7,719,844</b>	<b>6,756,620</b>	<b>5,902,213</b>	<b>4,934,050</b>	<b>5,141,301</b>	<b>4,209,992</b>	<b>3,146,997</b>	<b>2,084,001</b>	<b>1,166,831</b>	<b>97,217</b>
<i>Intangible assets</i>											
Pre-operation costs	202,303	161,842	121,382	80,921	40,461	-	-	-	-	-	-
Legal, licensing, & training costs	50,000	40,000	30,000	20,000	10,000	-	-	-	-	-	-
<b>Total Intangible Assets</b>	<b>252,303</b>	<b>201,842</b>	<b>151,382</b>	<b>100,921</b>	<b>50,461</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>TOTAL ASSETS</b>	<b>11,155,730</b>	<b>11,189,792</b>	<b>13,143,538</b>	<b>16,359,643</b>	<b>20,955,071</b>	<b>27,533,523</b>	<b>37,166,403</b>	<b>49,179,437</b>	<b>64,103,482</b>	<b>82,549,327</b>	<b>103,873,606</b>
<b>Liabilities &amp; Shareholders' Equity</b>											
<i>Current liabilities</i>											
Accounts payable		280,378	320,868	365,424	414,439	468,347	527,625	592,797	664,442	732,884	551,553
<b>Total Current Liabilities</b>	<b>-</b>	<b>280,378</b>	<b>320,868</b>	<b>365,424</b>	<b>414,439</b>	<b>468,347</b>	<b>527,625</b>	<b>592,797</b>	<b>664,442</b>	<b>732,884</b>	<b>551,553</b>
<i>Other liabilities</i>											
Deferred tax		152,971	544,429	1,281,332	2,469,963	4,381,281	6,954,542	10,358,793	14,779,632	20,434,222	27,183,685
Long term debt (Project Loan)	4,467,686	3,804,194	3,041,616	2,165,153	1,157,797	-	-	-	-	-	-
Long term debt (Working Capital Loan)	1,110,179	-	-	-	-	-	-	-	-	-	-
<b>Total Long Term Liabilities</b>	<b>5,577,865</b>	<b>3,957,165</b>	<b>3,586,045</b>	<b>3,446,485</b>	<b>3,627,760</b>	<b>4,381,281</b>	<b>6,954,542</b>	<b>10,358,793</b>	<b>14,779,632</b>	<b>20,434,222</b>	<b>27,183,685</b>
<i>Shareholders' equity</i>											
Paid-up capital	5,577,865	5,577,865	5,577,865	5,577,865	5,577,865	5,577,865	5,577,865	5,577,865	5,577,865	5,577,865	5,577,865
Retained earnings		1,374,384	3,658,760	6,969,869	11,335,007	17,106,029	24,106,372	32,649,983	43,081,543	55,804,356	70,560,503
<b>Total Equity</b>	<b>5,577,865</b>	<b>6,952,248</b>	<b>9,236,625</b>	<b>12,547,733</b>	<b>16,912,872</b>	<b>22,683,894</b>	<b>29,684,237</b>	<b>38,227,848</b>	<b>48,659,408</b>	<b>61,382,221</b>	<b>76,138,368</b>
<b>TOTAL CAPITAL AND LIABILITIES</b>	<b>11,155,730</b>	<b>11,189,792</b>	<b>13,143,538</b>	<b>16,359,643</b>	<b>20,955,071</b>	<b>27,533,523</b>	<b>37,166,403</b>	<b>49,179,437</b>	<b>64,103,482</b>	<b>82,549,327</b>	<b>103,873,606</b>

### 13.3 Cash Flow Statement

<b>Cash Flow Statement</b>											
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<i>Operating activities</i>											
Net profit		1,374,384	2,284,377	3,311,108	4,365,139	5,771,022	7,000,343	8,543,611	10,431,560	12,722,812	14,756,147
Add: depreciation expense		963,224	963,224	963,224	968,163	968,163	1,057,278	1,062,995	1,062,995	1,062,995	1,069,614
amortization of pre-operating costs		40,461	40,461	40,461	40,461	40,461	-	-	-	-	-
amortization of training costs		10,000	10,000	10,000	10,000	10,000	-	-	-	-	-
Deferred income tax		152,971	391,459	736,903	1,188,630	1,911,318	2,573,260	3,404,251	4,420,839	5,654,590	6,749,463
Accounts receivable		(433,442)	(36,198)	(77,444)	(88,188)	(100,341)	(114,003)	(129,357)	(146,681)	(166,176)	(156,775)
Equipment inventory	(6,385)	(654)	(721)	(795)	(877)	(967)	(1,066)	(1,175)	(1,296)	(1,429)	15,365
Raw material inventory	(625,869)	(121,653)	(140,017)	(160,866)	(184,519)	(211,331)	(241,700)	(276,075)	(314,958)	(233,391)	2,510,380
Pre-paid building rent	(480,000)	(48,000)	(52,800)	(58,080)	(63,888)	(70,277)	(77,304)	(85,035)	(93,538)	(102,892)	1,131,815
Accounts payable		280,378	40,490	44,556	49,015	53,908	59,277	65,172	71,646	68,442	(181,331)
<b>Cash provided by operations</b>	<b>(1,112,253)</b>	<b>2,217,668</b>	<b>3,500,274</b>	<b>4,809,066</b>	<b>6,283,936</b>	<b>8,371,956</b>	<b>10,256,085</b>	<b>12,584,387</b>	<b>15,430,568</b>	<b>19,004,952</b>	<b>25,894,678</b>
<i>Financing activities</i>											
Project Loan - principal repayment		(663,491)	(762,578)	(876,463)	(1,007,356)	(1,157,797)	-	-	-	-	-
Working Capital Loan - principal repayment		(1,110,179)	-	-	-	-	-	-	-	-	-
Additions to Project Loan	4,467,686	-	-	-	-	-	-	-	-	-	-
Additions to Working Capital Loan	1,110,179	-	-	-	-	-	-	-	-	-	-
Issuance of shares	5,577,865	-	-	-	-	-	-	-	-	-	-
<b>Cash provided by / (used for) financing activities</b>	<b>11,155,730</b>	<b>(1,773,670)</b>	<b>(762,578)</b>	<b>(876,463)</b>	<b>(1,007,356)</b>	<b>(1,157,797)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<i>Investing activities</i>											
Capital expenditure	(8,935,371)	-	-	(108,817)	-	(1,175,415)	(125,969)	-	-	(145,825)	-
Acquisitions											
<b>Cash (used for) / provided by investing activities</b>	<b>(8,935,371)</b>	<b>-</b>	<b>-</b>	<b>(108,817)</b>	<b>-</b>	<b>(1,175,415)</b>	<b>(125,969)</b>	<b>-</b>	<b>-</b>	<b>(145,825)</b>	<b>-</b>
<b>NET CASH</b>	<b>1,108,105</b>	<b>443,997</b>	<b>2,737,695</b>	<b>3,823,786</b>	<b>5,276,580</b>	<b>6,038,744</b>	<b>10,130,116</b>	<b>12,584,387</b>	<b>15,430,568</b>	<b>18,859,127</b>	<b>25,894,678</b>

## 14 KEY ASSUMPTIONS

### 14.1 Operating Cost Assumptions

Description	Details
Office Expenses (Printing, Stationery, Entertainment, Etc.)	15% of Admin Expense
Promotional Expenses	5% of Revenue
Communication Expense	Rs. 60,000 Per Annum
Travelling Expense	3% of Administration Expense
Electricity Growth Rate	10%
Salary Growth Rate	10%
Machinery Maintenance	2% of Machinery Cost
Raw Material Inventory (In Days)	90
Operating Costs Growth Rate	5%
Vehicle Maintenance Expense	Rs. 120,000 Per Annum
Accounts Receivable Cycle (In Days)	15
Accounts Payable Cycle (In Days)	30

### 14.2 Production Assumptions

Description	Details
<b>BREEDING</b>	
No. of Male Birds at 30% capacity	1,414
No. of Female Birds at 70% capacity	3,300
Total No. of Birds at 60% capacity	4,714
No. of birds for feed consumption (extra 1%)	4,761
No. of Male Birds at 100% capacity	2,357
No. of Female Birds at 100% capacity	5,500
Total No. of Birds at 100% capacity	7,857
No. of birds for feed consumption (extra 10%)	7,936
Purchase price per Adult Breeder 6 weeks old (Rs.)	65
Breeders mortality rate	1%
Feed requirement per female bird per day (kg)	0.035
Feed requirement per male bird per day (kg)	0.030
Total feed requirement per day (kg)	159.51
Weight per bag (kg)	50



No. of bags per day	3.19
Cost per bag of feed (Rs.)	2,150
Total feed cost per day (Rs.)	6,859
Vaccination expense per annum for breeders (Rs.)	23,807
<b>EGG PRODUCTION</b>	
Egg production percentage	85%
Egg production per day per bird	1
Total number of eggs produced per year at 60% capacity	1,023,825
Number of eggs produced per day at 60% capacity	2,805
Egg time period in incubator/setter (days)	15
Egg time period in hatcher (days)	3
Number of batches per year	121
Number of eggs (produced on farm) per batch for hatchery	8,415
Number of eggs (produced on farm) placed in hatchery in year	1,018,215
<b>HATCHERY</b>	
Incubator/Setter capacity per machine	45,000
Hatcher capacity per machine	15,000
No. of eggs placed in hatchery per batch	8,415
Total time required per batch (days)	18
Time lapse between batches (time period in hatcher) in days	3
No. of batches per year	121
Hatchability	90%
No. of DOCs produced per batch at 60% capacity	916,333
<b>DOC Sales</b>	
Number of DOCs per batch	7,573
Number of batches per year	121
Sales price per DOC	10
<b>Hatchery Service</b>	
No. of eggs placed in hatchery per batch	6,585
No. of batches per year	121
No. of eggs placed during the year	796,785
Service charges per egg (Rs.)	1.50

### 14.3 Revenue Assumptions

Description	Details
Annual DOCs Production - Year 1	916,333
Sales Price Per DOC	Rs. 10
Hatchery Service Charges Per Egg	Rs. 1.50
Sales Price Of Adult Breeder (200 Grams Live Weight)	Rs. 40
DOC Sales Price Growth Rate	10%
Hatchery Service Charges Growth Rate	10%
Adult Breeder Sales Price Growth Rate	5%
Production Capacity Utilization – Year 1	60%
Production Capacity Utilization Growth Rate	5%
Maximum Capacity Utilization	100%
Percentage Decrease In Rental Capacity	5%

### 14.4 Financial Assumptions

Description	Details
Debt	50%
Equity	50%
Interest Rate on Debt	14%
Debt Tenure	5 Years
Debt Payment / Year	12
Project life (Years)	10