A STUDY ON THE PERFORMANCE OF POULTRY FARMERS IN SAMTLANG VILLAGE, MIZORAM

A Dissertation submitted in partial fulfilment for the award of the degree of Master of Philosophy in Economics

By

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CERTIFICATE

This is to certify that Shri R. Lalbiakzuala has worked under my supervision and guidance on research topic entitled, *'A Study on the Performance of Farmers in Samtlang Village, Mizoram'* for the degree of Master of Philosophy in Economics, Mizoram University, Aizawl. The Dissertation is the result of his investigation into the subject and was never submitted to any other University for any research degree.

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DECLARATION

I, R. Lalbiakzuala, do hereby declare that this M.Phil Dissertation entitled, '*A Study of the Performance of Poultry Farmers in Samtlang Village, Mizoram'* is an original study that was carried out by me under the supervision of Prof. Vanlalchhawna, Professor, Department of Economics, Mizoram University.

I, further declare that this dissertation has not been submitted for any research degree in any other University or Institution.

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(R. LALBIAKZUALA)

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PART I. INPUTS, ACTIVITIES, OUTPUTS AND BENEFITS

1.1. Level –I: Inputs

1.1.1 Demographic Characters

a. Age: ___ years

b. Gender: Male ☐ Female ☐

c. Education:

Tenth grade or below ☐

High school pass or equivalent ☐

Bachelor's degree and above ☐

d. Social category: (Select one that apply)

1. General ☐ 2. Scheduled caste ☐

3. Scheduled tribe ☐ 4. Other Backward caste ☐

e. Family type: 1. Nuclear 2. Extended

f. Family size:

g. Poultry occupation: 1. Primary 2. Secondary

h. Experience of broiler farming (years): Contract ( ) Non-Contract ( )

1.2 Level 2: Activities

1.2.1 Physical and human resource activities

Inputs	Number
No. of sheds	
Batches of the poultry housed yearly	
Family labor working in farm per batch	
Hired labor working in farm per batch	
Total labor per batch (hired and family)	

1.3 Level 3: Outputs

1.3.1 Details of the Outputs (Per Batch)

A. Broiler Birds	
1. Chicks housed / flock size (No)	
2. Mortality (Ns)	
3. Birds sold (No)	
4. Birds lifting days (No)	
5. Sales rate (Rs.)	
B. Productivity	
1. Mortality %	
2. Birds sold (Kg)	
3. Feed consumed (Kg)	
4. Birds sale weight (Kg)	
C. Efficiency	
1. FCR	
2. Marketing age (days)	
3. Weight gain (grams/day)	
D. **Economics**	
(a) Inputs	
1. Chick cost (per chick)	
2. Chick cost (per kg of the bird)	
3. Feed cost (per kg)	
4. Feed cost (per kg of bird)	
5. Medicine cost (per batch	
6. Medicine cost (per.kg of bird)	
7. Labor cost (per batch	
8. Labor cost (per kg of bird)	
9. Bedding material cost	
10. Bedding cost (per.kg of bird)	
11. Electricity cost (per batch)	
12. Electricity cost (per kg of bird)	
13. EAS cost (per kg of bird)	
14. Miscellanies cost (per batch)	
15. Miscellaneous cost (per kg of bird)	
16. Total cost (per kg of bird)	
(b) Outputs	
1. Rearing charges (RC)	
2. Sale of birds (Rs./ kg live weight)	

3. Sale of manure	
4. Sale of manure (Rs./ kg live weight)	
5. Sale of feed bags	
6. Sale of feed bags (Rs./ kg live weight)	
7. Total returns	
8. Profit / loss	
9. Gross rearing charges (Standard RC +/- Incentives / Penalty	
10. Costs (–) sale (costs of labor, bedding, electricity & miscellaneous) - (sale of manure and feed bags)	
11. Net rearing charges (Gross RC - (Costs(-)Sale)	
12. Final return (Rs./ kg live weight)	
13. Final return / bird	

E. EAS: How frequently you use the following information sources for EAS

EAS Source	**Frequency of Utilization***				
	1	2	3	4	5
Integrator					
Govt. research station					
Govt. veterinary doctor (free)					
Govt. veterinary doctor (payment)					
Private veterinary doctor					
Private poultry consultants					
Any other (Please specify)					

*1- Very Rarely; 2- Rarely; 3- Occasionally; 4- Frequently; 5-Very frequently

1.4 Level 4: Farmer's Reactions

i. What factors motivated you to do CBF?

a.
b.
c.
d.

ii. Did you change the integrator(s) / Input providers in the past two (?) years?

☐ Yes ☐ No (If no, go to next question)

iii. What were the reasons for changing the integrators / input providers?

Name of the Integrator / Inputs provider	Reasons for changing

1.5 Level 5: Perceptions

1.5.1 Farmers' Perceptions on CBF: Following table contains the list of the inputs and outputs that are either utilized or produced. Please indicate your level of satisfaction to each of the item listed below.

S.N.	Inputs / Outputs	Degree of Perception				
A	**Inputs (Total score of (i + ii + iii + iv)**					
I	**Supply of Chicks**					
		Extremely dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Extremely satisfied
1.	Cost					
2.	Body weight					
3.	Timely supply					
4.	Strain					
5.	Flock size per batch					
6.	No. of batches per year					
7.	Growth rate					
8.	Gap between batches					
II	**Supply of Feed**					
1.	Cost					
2.	Quality					
3.	Quantity					
4.	FCR					
III	**Supply of Medicines**					
1.	Cost					
2.	Quality					
3.	Quantity					
IV	**Provision of EAS**					
1.	Applicability of EAS					
2.	Understandability of message (Treatment of EAS)					
3.	Frequency of EAS					
4.	Timeliness					
5.	Relevance of EAS					
6.	Adequacy of the EAS					
7.	Usefulness of EAS					

8.	Technical know-how of EAS provider					
B	**Outputs (Total Score of I, II & III)**					
I	**Broiler bird**					
1.	No of birds produced/sold					
2.	Live wt. at the time of sale					
II	**Manure**					
1.	Quantity produced					
2.	Method of disposal					
3.	Economic benefit					
III	**Payment**					
1	Remuneration					
2	Regularity					
3	Pricing method					

1.5.2 Intention of EAS (Check any one)

a. Information only

b. Information + knowledge ☐

c. Information + knowledge + skill ☐

d. Information + knowledge + skill + attitude change ☐

LEVEL 6: Practice Change

1.6.1: Adoption of Technical Advises: Please rate your level of adoption of the following technical advices (1=not adopted, 2=discontinued 3= partially adopted, 4=fully adopted.)

Technical advice related to:	**Not adopted**	**Discontinued**	**Partially adopted**	**Fully adopted**
Chicks				
Housing				
Feeding practices				
Medications				

1.6 Level 7: End Results

1.7.1 What do you think are the most important strengths, weaknesses, opportunities and threats of Contract / Non Contract Broiler Farming?

Strengths

1.

2.

3.

4.

Weaknesses

1.

2.

3.

4.

Opportunities

1.

2.

3.

4.

Threats

1.

2.

3.

4.

Thank you very much for taking part in the survey

CHAPTER – 1

INTRODUCTION

Chapter-1

INTRODUCTION

1.1. Introduction

The population of India increased from 361 million in 1951 to 1.252 billion in 2013. Although the per capita availability of food grains also improved during the period, the land holdings as well as the per capita availability of agricultural land have been shrinking. For instance, they have shrunk to around 1.15 and 0.14 hectares respectively by the turn of the century[1]. The competing demands for land for other sectors of development have shrunk land further. In the larger context of ensuring food and nutritional security to the future generation, the only way to fulfill this obligation is through continuous gain in productivity of various agricultural commodities.

Around 50 per cent of the total rural population in India is without both subsistence income and housing due to small landholding. There is a general dependence on monsoon for crop production and consequentially, a general inadequacy of agricultural inputs. This has resulted in a large portion of the population of India living in poverty and directly affecting their productivity as well as their innovative power.

[1] Ministry Of Agriculture, Government Of India (2014), '*All India Report on Number and Area of Operational Holdings.'*

The problems faced by rural population can be primarily classified into-livelihood, living conditions, education and social upliftment. These deficiencies affect the quality of life of rural population. The factors that adversely affect the income generation are scarcity of food, fodder and fuel; inadequate housing; lack of irrigation; unemployment and underemployment; lack of purchasing power; low crop yields; small land holding and poor quality of livestock. Once the rural population can start earning adequate income, they would be able to overcome other problems.

Human food derived from animal is gaining importance in the dietary practice of the Indian masses. Planning in the agricultural sector should be oriented such that emphasis is put on livestock production. One such industry is poultry farming which has become the most popular avenue of self employment among the rural masses. In addition, it has attracted much attention from the nutritional content angle.

Poultry farming in India have proven to be capable of enhancing both the productivity per hectare and the productivity per head in agricultural sector. Among poultry farming, broiler breeding through the application of modern technology has been found to be warmly welcomed by the agriculturists and others[2]. Mizoram presents an encouraging picture in poultry farming. The number of commercial broiler poultry farms has increased, providing both direct and indirect employment to both skilled and unskilled laborers. Though

[2] Jagapathi, Rao (1990*), 'Profile of Poultry Industry in India*,' Indian Poultry Industry Year book, P.53.

of recent origin, commercial poultry farming has achieved momentum in Mizoram because of its wide and varied potential and capability of employment creation, low investment, quick returns, lesser combination of various factors of production, enhanced productivity per unit of agricultural land, maintenance of soil fertility, etc. This study has aimed at detailing the various components of cost and revenue in the business of poultry farming and the deducing of empirical evidences on the nature of relationship between different variables, for instance, the gross income, rate of productivity, extent of capacity utilization, size of farms in terms of number of birds reared and the farms' overall financial performance. Along with this, a descriptive approach was made to highlight the challenges and opportunities in poultry farming in Mizoram, with special emphasis on its economic and financial aspects.

This study entitled 'a study on the performance of poultry farmers in Samtlang village, Mizoram' is a search into the growth and development of poultry farms, specifically, in the private sector. The title is further justified by a detailed analysis which encompasses such factors and dimensions that reflect the overall efficiency of the poultry farms. The study has also attempted to make an appraisal of functional problems currently being faced by the farms and to delineate the possible reasons for the unprofitability of poultry farms, as far as the village is concerned.

1.2. Significance of the study

Mizoram is largely an underdeveloped state with and underdeveloped economy. The mainstay occupation of the people has been dominated by Shifting Cultivation almost throughout its short history. It was only recently that opportunities in other areas of industry have been developed through the combined efforts of the Government of India and Mizoram government.

Poultry Farming is fast becoming one of the most important subsidiary occupations of the farming community in Mizoram. Poultry Farming is a remunerative business both in rural and urban areas due to the requirement of small space, low capital investment and quick return throughout the year. It has a_significant role in the eradication of malnutrition and poverty as well as eliminating under-employment among the rural masses. Considering the industrial backwardness and the mounting rate of unemployment and underemployment, commercial poultry farming can effectively help in the economic development of Mizoram.

A number of notable Government schemes like Assistance to State Poultry Farms, Rural Backyard Poultry Development and Poultry Estates under Centrally Sponsored Schemes (CSS) and New Land Use Policy (NLUP) and Mizoram Intodelhna Project (MIP) under state schemes have been implemented to develop poultry industry in Mizoram. For instance, poultry farming is one of the primary activities under NLUP with the State Agricultural Department as the nodal agency. As a result, a large number of households

both urban and rural have adopted poultry as their main occupation in the state. For instance, it is now observed that majority of households in Samtlang, Lungleng, Hualngo and Melriat villages in Aizawl district are now primarily dependent on poultry

It is imperative, therefore, to study the economics of the growth and development of commercial poultry farms in the state. The series of studies conducted by technical veterinarians and others regarding flock size, system of rearing, livability, housing, feeding efficiency, processing and marketing etc., have hardly touched the economic and financial aspects of commercial poultry farming. Hence, an attempt has been made here to analyze different aspects of commercial poultry farming in Samtlang.

Thus, in light of the recent developments, it is worth examining the recent trend and growth scenario of poultry industry in Mizoram. This study is meant to illuminate the overall development of poultry farms in Samtlang to arrive at-

a) Useful empirical insights for effective policy formulation and implementation, and

b) Marketing and financial data for the welfare of current and future poultry farmers in Mizoram.

1.3. Scope of the study

The Government of Mizoram under the New Land Use Policy Program has set up a comprehensive development scheme for the development of animal husbandry in general and poultry farms in particular. Plan has been made under the same scheme to develop better vertical integration farming system i.e. contractual system in Samtlang, Mizoram to increase the production of egg and meat and provide better remuneration to poultry farmers.

Samtlang today is fast becoming an important hub of poultry industry in Mizoram. Located at a distance of 14 kilometers from Aizawl, the village comprises of 160 households of which 50 families are actively engaged in varying degrees of poultry farming, both full-time and part time. It is one of the few villages in Mizoram where one can find a large concentration of households engaging in large-scale production and commercialization of poultry meat and eggs. Samtlang, today, is the largest in the state in terms of gross production, total number of poultry farmers, total number of poultry hens and total number of households engaging in employment directly related to poultry and its ancillary industries. Accordingly, Samtlang village is the selected area of this study.

1.4. Research problem

The present study is to evaluate and bring into picture various aspects of poultry farming in Samtlang. The major problems posed are:

i. What is the extent of growth and development of commercial broiler poultry farming in Samtlang?
ii. Whether the individual poultry farms are functioning efficiently?
iii. Whether the trends in input cost are in proportion with output prices?
iv. To see if the current levels of profitability of broiler poultry farms are being supported by feed convertibility, capital and labour productivity, capacity utilization and capital intensity?
v. How far the sizes of commercial broiler poultry farms influence the financial performance?

1.5. Objectives of the Study

The proposed study will try to examine the problem of employment and livelihood condition of poultry farmers in Samtlang with the following objectives in mind:

1. To assess the profitability of poultry farming through cost and return of poultry farming.
2. To identify the problems and constraints associated with poultry farming.
3. To suggest possible solutions for those problems.

1.6. Hypothesis

The following hypothesis is proposed to be tested in the study:

1. There is a positive correlation between production and farm input in poultry farming.

1.7. Definition of concepts

The important indices and terms used to express the performance level of poultry farms are briefly given in this part as:

- *Capacity Utilization:*

  It stands for the ratio of floor area occupied to the floor area available. Symbolically-

  *Capacity utilization = (Occupied floor area in square foot/Actual floor area in square foot)*100*

- *Capital Employed*:

  This refers to gross capital employed (i.e. *current assets + fixed assets*)

  .

- *Capital Intensity*:

  It relates the investment in fixed assets with the input of labour hours. Symbolically-

  Capital intensity = Input of fixed capital in rupees/Input of labour hours

- *Capital Productivity:*

  It relates the output of meat with the investment in fixed assets. Symbolically-

  Capital productivity = Output of meat in kilograms/Fixed capital investment in rupees

- *Feed Price ratio:*

  It measures the amount of revenue generated from every rupee spent on feed. Symbolically-

  Feed price ratio = Total value of meat or eggs/Total cost of feed provided

- *Labour Productivity:*

  It is the relation between the quantity of meat produced and the total input of labour hours. Symbolically-

  Labour productivity = Total live weight of fowls/ Labour input in hours

- *Return on Investment:*

  This shows the relationship between net profit and capital employed. Symbolically-

  *Return on Investment = Capital turnover ratio*Net profit ratio*

1.8. Research methodology

The study was based on primary and secondary data. The unit of analysis was individual poultry farmers in Samtlang village who were the respondents for this research.

a. *Primary Data:*

Structured questionnaire and personal interview were employed. Most of the respondents from the private poultry farms were reluctant to disclose information regarding poultry farming unless they are convinced about the purpose and use. Personal interview was found to be more appropriate than any other method of data collection. Of the 160 families in the village, 50 are actively engaged in poultry farming. Hence, a sample size of 30 was purposively chosen using Simple Random Sampling making use of Tippet's random number table.

Most of the data pertaining to poultry farming was collected from the owners of the farms, who were the primary respondents of the study. Data relating to wage payment, medication, shed-cleaning, feeding practices, etc. were also collected from the workers as they were better sources of information than many of the owners. This approach also provided chances for cross checking. The data so collected formed the basis for preparing profit and loss accounts and balance sheet of individual units. Except a few, all other poultry farms in private sector were unable to give dependable information. Personal observation was

also used for collection of data especially on issues such as flock size, equipments used, type of housing, number of sheds occupied and unoccupied, water and storage facilities, etc. The collected data were analyzed using relevant statistical tools.

b. Secondary Data:

Along with primary data, secondary data from various sources such as Directorate of Animal Husbandry & Vety Department, Aizawl, books and journals on Poultry Sciences, Publications of Directorate of Economics and Statistics, Poultry Industry Yearbooks, M.V.Sc. dissertations and Ph D. theses on poultry science were used. Unpublished materials and documents from hatcheries, suppliers of feed and pharmaceuticals within the state also formed the core material for secondary data.

c. Analytical Tools:

The data obtained from primary and secondary sources were analyzed in accordance with the objectives of the paper. Relevant statistical tools like percentage, mean, regression, etc. were employed to analyze the data as and when necessary.

1.9. Limitations of the study

Considerable care and thought were exercised in making the study as objective and systematic as possible. Though every care was taken to collect and interpret the relevant information, there could be some distortion in the interpretation of the responses. The opinions of the respondents may not be free from individual biases and prejudices. It may be recognized that the findings of the study should not be generalized beyond the limits of the districts/states where the study was conducted. In other words, adequate care must be taken in applying the findings of the study to other areas. The generalizations of results should be applied in the broad context only where similar situations prevail.

1.10. Chapterization

Chapter I : *Introduction*

The first chapter gives a brief introduction on poultry farming in India. It also contains the objectives, hypotheses, methodology, significance of the study, etc.

Chapter II : *Review of Literature*

The second chapter presents a review of literature related and relevant to poultry farming and its related problems.

Chapter III : *Overview of Poultry Industry in India*

The third chapter presents an overview of the growth, development and current scenario of poultry industry in India and Mizoram.

Chapter IV : *Empirical and Performance Analysis of Poultry Farmers in Samtlang*

The fourth chapter presents a statistical analysis of primary and secondary data collected. It is elucidated using tables and figures.

Chapter V : *Summary of Findings and Conclusions*

The fifth chapter summarized the main findings of the study and concludes with recommendations for further development.

Bibliography

CHAPTER - 2

REVIEW OF LITERATURE

Chapter-2

REVIEW OF LITERATURE

2.1. Introduction

This section is to provide an overview of the available literature on the subject. This chapter examines previous studies related to poultry farming. A number of studies were conducted on various technical aspects of poultry farming. Some of them which are closely related to the present work are being reviewed here.

Hawthorne, et al. (1949) and Burlingam, et al. (1949) conducted studies on poultry reared under backyard system. Their study disclosed that the earnings per fowl are very much dependent on the flock size. But Cagle (1956) who made an evaluation about the fowls reared under the backyard system opined that income per fowl is not dependent on flock size but is influenced, to a great extent, by rate of mortality and feed efficiency. Davis, et al. (1963) extended the enquiry about local fowls reared under backyard system to other directions and concluded that earnings per fowl are dependent on flock size, labour utilization and asset management.

Pandey, et al. (1985) made an evaluation about poultry units maintained under deep litter system where White Leghorn layer fowls and Rani Shaver broiler fowls were reared. The study was about minimum economic size of

poultry units. They also concluded that earnings per fowl are dependent on flock size, labour utilization and asset management.

The studies regarding the performance efficiency of different sizes of poultry farms were conducted by *Taluk Dev, et al.* (1985), Aboobecker (1988), Jadhav, et al. (1989), Pothuluru (1991) and Krishnakumar (1992). Aboobecker evaluated the capital productivity and profitability of selected breeds of fowls in farms of different sizes in Thrissur. It was concluded that while profitability was more characteristic of the large sized farms, productivity was more among the small sized farms. Jadhav and Kasav attempted at a break-even analysis approach on different sizes of broiler poultry farms in Maharashtra. It concluded that optimum results were recorded by large size farms. Pothuluru, in his study about the economics of layer and broiler poultry farms in Andhra Pradesh, came to the conclusion that small size poultry farms do have optimum viability and economy. Krishnakumar, in an attempt to evaluate the commercial viability of egg and meat type poultry enterprise in Andhra Pradesh suggested for large size poultry farms with inbuilt feed compounding units. Taluk Dev, et al. made evaluation about different flock sizes. According to them, flock size influences investment and input-output ratio in broiler poultry farms.

Clayton (1967) made a detailed study about cost and revenue of layer poultry farms maintained under backyard system. The study revealed that rate of mortality and morbidity decides the input cost and output prices to a great extent. Saxena, et al. (1971) enquired about cost, revenue and productivity aspects of layer and broiler poultry farms. It was concluded that the

involvement of own labour accelerated the productivity. The input costs like feed, day old chick, preventives and medicines showed a more than proportionate increase than that of revenue. But the enhanced output of fowls due to the accelerated demand for the product, made the total cost per unit to come down. Panda (1973) looked into the employment potential, income generation and cost structure of layer poultry farms. The study remarked that layer poultry farming is capable of generating additional income and employment opportunity. Rosario (1987) made a comparative study about layer and broiler poultry farms. The study revealed that high capital turnover, accelerated demand for the product, improvement in weight gaining and reduction of market age made broiler poultry farming more attractive.

Nagabhushana (1979) and Singh (1980) made studies about rearing and marketing aspects of layer poultry. Nagabhushana Rao came to the conclusion that size of layer poultry farms and the structure of marketing determine the aggregate cost. Patel (1981) made out the research conclusion that economies in procurement, processing and marketing decide the success or failure in poultry farming. Prabhakaran, et al. (1981) identified that economies of scale of operation is behind the success of large size poultry farms and degree of personal involvement of the farmer is the key to success in small size farms. Kothandaraman, et al. (1982) made the conclusion that size of farm, methods of rearing fowls and market structure decided the survival of poultry farms. Sathish Chandra (1982) had the view that superior quality of day old chicks along with the scientific methods in the sphere of farm management

decided the success of layer and broiler poultry farms. David (1985) regarded financing and marketing aspects as the central point of success or failure in poultry farming. Taneja, et al. (1986) in their study pointed out that economical rearing and timely marketing are important factors for achievement in poultry farming. Ramappa (1987) disclosed that efficient rearing is the basis for success in layer and broiler poultry farming. Maruthiram (1988), Marimuthu (1984), Gnaanamani (1986), Sadagopan, et al. (1987) and Thomas (1990) focused on feed management. Maruthiram concluded that feed accounted for the highest segment of cost. Marimuthu concentrated on low cost feed for minimizing the rate of mortality and optimizing the return from layer poultry farming. Gnaanamani came to the conclusion that feed management is the decisive element in the success of layer and broiler poultry farming. Sadagopan and Srivastava concluded that balanced feed when provided at definite intervals with minimum feed wastage could make the poultry enterprise a successful venture. Thomas proposed to rear the fowls under backyard system with locally available feed made into a properly balanced diet, for thriving poultry farming. Atkara, et al. (1987) had the opinion that reduction of feed wastage is the key successful factor in layer and broiler poultry farming.

Glover (1983, 1987) is positive about the potential of contract farming. While acknowledging that contracts are often exploitive, he also emphasized that contract farming and had very often led to a significant rise in living standard. His studies also paid considerable attention to the impact of contract farming on regional development but claimed that the issue was not

included in the contracts. In addition Ghee, et al. (1992) had evaluated the contract schemes in Malaysia as successful, with a notable success in increasing farmer incomes and national economic returns. The same argument was given by Miyata, et al. (2009). Contract farming system has been estimated to dominate 75 percent of the Malaysia's chicken meat production through efficient integrated production. However, there are issues affecting this system particularly relating to contract agreement, marketing freedom, effectiveness of extension services, prices of input-output, risk of losses, technical performance, and impact on farmer life's well-being (Tapsir, et al. 2011). The survival of broiler contract farmers depended on their performance and profitability. According to D'Silva (2009), contract farming has tremendous potential to boost the agricultural sector in Malaysia. The survival of the industry depended very much on three major factors, namely its effectiveness, ability to withstand obstacles in the competitive market and the competitiveness of those who run the business.

Ramaswamy (1986) reported that the type of poultry shed, its ventilation and the direction in which it is built, etc. influences the heat stress. He suggested internal air filtration and reduction of temperature inside the farms for better livability and weight gain. He also suggested 'All in All out' system for optimum return from broiler fowls.

In the opinion of *Wilson, et al.* (1986) lack of sufficient feeder space and lighting give chances for leg abnormalities leading to the culling stage. They also revealed that the relation between marketability and market age,

market age and live weight of fowls, live weight and feed conversion ratio, feed conversion ratio and market age, etc. are the crucial variables which determine the profitability of broiler poultry farms. David (1985), Ramaswamy (1986) and Taneja, et al. (1986) clearly suggested proper record keeping for scientific and successful poultry farming.

Reddy (1987) and Sunitha Anand (1987) compared the advantages of rearing layer and broiler fowls in deep litter backyard and cages. Reddy contends that under cage system, feed conversion ratio and rate of mortality is very low and the system is highly suited for poultry farms in coastal regions. But Sunitha concluded that cage system needs more capital investment and leads to cage fatigue which develops cannibalism among fowls. But the labour productivity is found high in cage system.

Vikuna, et al. (2000) analyzed poultry farming with respect to vertical integration and contracting in the U.S. The study found that poultry industry in general and the broiler industry in particular are often considered a role model for the industrialization of agriculture. It found that production contracts with independent farmers as the critical link in the vertically integrated chain of procurement of inputs, production, processing, marketing, and distribution.

Steve W. Martinez, et al. (2002) assessed the vertical coordination of marketing systems in the Poultry, Egg, and Pork Industries in the United States. The study was conducted to assess whether contracting and vertical integration provided a means for reducing transaction costs leaving more gains from trade

to be distributed among producers and consumers. It concluded that transaction costs affect decisions to contract or vertically integrate in the poultry, egg, and pork industries. Spot-market trading is less feasible in markets characterized by markets with few producers and processors, close proximity of producers and processors and important scheduling and timing factors related to raw product deliveries. These situations expose investors to hazards related to unscrupulous behavior. As the degree of uncertainty increases, contracts should be used that provide the contractor with greater control over production. Policymakers can indirectly influence pressures to enter production contracts and vertically integrate based on how policies are shaped, enacted, and enforced. Laws and regulations can affect firm strategies and the competitive environment in which firms operate. In addition to reducing transaction costs, the study also concluded that contracts and vertical integration are also associated with gains in production efficiency and more value-added product offerings of consistent quality.

Victoria (2003) studied the profitability of poultry farming in the Philippines. The research study was conducted to characterize the chicken growers and their farms, determine farm profitability, and identify the problems that beset the industry. It found that contract growing of chicken was a highly profitable agribusiness enterprise and none claimed that the business was not profitable. As to the problems encountered, no severe problems affected the industry. But to a slight extent, growers complained of the occurrence of typhoon, delay in the delivery of the supplies by the company and outbreak of

disease. Based on the problems faced by the growers, the study recommended therefore that measures of disease prevention should be further enhanced and partner companies should endeavor to deliver supplies promptly.

Begum (2005) studied the profitability of vertically integrated contract poultry farming in Bangladesh. The study was undertaken to identify incentives for poultry farmers to participate in contract farming system in Bangladesh. The study found that poultry meat was the most widely accepted meat in Bangladesh. Although the government provided various favorable policies for poultry sector development, meat deficiency was still high. This was largely because of the absence of the necessary backward and forward market linkages i.e. rural farmers and small scale entrepreneurs lacked both reliable and cost efficient inputs, credit for running business and guaranteed and profitable markets for their output. The study concluded that with effective management, vertically integrated contract farming system could be a means to develop markets and bring about the transfer of technical skill that is profitable for both farmers and integrators. It was revealed in the study that contract farmers got several incentives from vertically integrated firm such as credit, production and price risk reduction, marketing assistance, technical know-how etc. The study also found that the contract farmers were better off in their net income by getting the high net return from the poultry farm.

Conroy, et al. (2005) studied the profitability of poultry farming in Rajasthan and Tamil Nadu, India. The research project investigated the production problems facing backyard poultry-keepers. It found that backyard

poultry-keeping was a significant livelihood activity for many poor rural families in India and for women in particular. A baseline survey of 90 backyard poultry-keepers provided a general overview of socio-economic factors, practices and constraints. Serious problems were identified in both locations, with high mortality rate in chickens and poor hatchability rate. In both locations the project found that for the period under investigation, predation was a more important cause of mortality than disease. On-farm trials to improve hatchability rates found technologies based on locally available materials to be effective. The productivity of scavenging poultry systems tends to be low, with high mortality rates and low hatchability rates. Newcastle disease (ND), which is widely believed to be the main constraint affecting chickens in India, was not the major cause of mortality in the project locations; the main cause was predation by birds of prey and mammals. There was considerable scope for improving the productivity of scavenging systems with low-cost interventions enhancing their robustness in the face of a burgeoning commercial poultry sector. The study concluded that effectively conveying extension messages to potential users will require the use of mass media (radio in particular, but also newspapers and television) and the social infrastructure of women's self-help groups.

Bhende, et al. (2006) analyzed the production and cost of broiler meat in a case study of Karnataka. The objective of the study was to generate reliable field data of Poultry Industry which can become the basis for future state interventions. It concluded that the poultry industry has a multiplier effect.

It generates direct employment in farming, hatcheries and pharmaceutical sectors. It also generates employment in processing and marketing sectors and, thus, helps in augmenting employment in both rural and urban areas. Hence, it is imperative to promote broiler farming even by providing some subsidized services to farmers. The demand for poultry products in the domestic market would increase in the near future due to an increase in the per capita income. Almost all the broiler farm owners complained about high input prices in general and feed prices in particular. Hence, there is a need to search for cheaper alternatives in feed compounds. The mortality seems to be on the higher side and hence extension personnel should improve awareness about better management practices among farmers

Hamra, et al. (2010) studied the profitability of poultry farming in Lebanon. They concluded that the broiler business in Lebanon is profitable assuming variation in prices of chicks, feed, and price/kg of meat remain within reasonable levels. Even when the cost of feed is high, the price/kg of meat could be above the average, compensating for the high costs of the operation. Sensitivity analysis in this study has shown that even if chick and feed costs are high while meat prices drop, the poultry farm would still break even. If a worst-case scenario of low prices of meat/kg and high prices of feed and chicks occur, good management practices would be critical to maintain profitability.

Islam, et al. (2013) does a comparative study on commercial broiler rearing pattern in plain and coastal regions of Bangladesh. The study was conducted to compare the present status and rearing pattern of broiler. It

concluded that own money and bank loan were the main source of money. NGO's loan was also another important source of money. It shows that most of the broiler farmers (36.54%) used own veterinary knowledge for disease combat. Farmers in the Bhola district got veterinary service from NGOs. About half of the broiler farmers faced great marketing problems due to unfavorable market for selling broiler and high price of feed and chick. And the middle aged group and farmers of secondary level education were highly involved with broiler farming.

Murthy, et al. (2013) studied the profitability of poultry farming in Andhra Pradesh. The study concluded that contract farming has become an increasingly important aspect of agri-business as well as poultry sector in recent years. Poultry farming could play an effective role in improving the economic status of the rural people by increasing their income besides providing nutritious food through meat and eggs. From the farmer's point of view, contractual arrangement can provide them with access to production services, credit as well as knowledge of new technology. Moreover, pricing arrangements can reduce the risk and uncertainty. Contract farming could act as an effective tool in mitigating risks faced by farmers while marketing of poultry produce to final consumer. The paper threw light on contract farming helping both the parties i.e., the producers and the companies, which are involved in contract farming system. The case study found that in contract farming, major benefits come from reduction in transaction costs and assurance of regular income for broilers farmers

Islam, et al. (2014) analyzed the effect of family training on profitability of small-scale broiler farming in Joypurhat district of Bangladesh. The study analyzed the significant role played by poultry industry in the growth and prosperity of the people of Bangladesh and compares the productivity and profitability of trained and non-trained small-scale broiler farmers in the Joypurhat district of Bangladesh. It concluded that trained broiler farmers made significantly higher profit than non-trained farmers which is the direct impact of the family training. It also concluded that immediate step must be undertaken to enrich the farmer's knowledge and skill on small-scale commercial broiler farming through family training with updated technologies for sustainability of prospective poultry farming.

Balamurugan, et al. (2014) studied the cost and benefit of investment in integrated broiler farming in Theni District of Tamil Nadu. It was carried out based on the primary data collected from 150 broiler farmers. The study showed that the total fixed investments per bird have been highest on small farms, followed by medium and large farms. The total cost of meat production per bird and returns per bird over the variable costs was found highest on small broiler farms, followed by medium and large farms. On the basis of net present value, and internal rate of return, investment in broiler farming was found profitable in all farm-sizes, with the highest profitability on large farms, followed by medium and small farms. The small broiler farms were observed to be highly sensitive to increase in costs and decrease in net returns. The study further observed that broiler farming was a profitable venture with a bright

future in Tamil Nadu for improving economic status of the farming community in general and in the study area in particular.

Rahman (2014) studied the profitability of poultry farming in Bangladesh. The study aimed to determine the cost, return, and profitability of broiler production in selected areas of Trishal Upazilla in Mymensing district, Bangladesh. The findings revealed that poultry production was a profitable enterprise and that poultry farming and vegetable cultivation were profitable farm activity in the short run. The study also found that poultry sector played an important role in solving poverty, unemployment and malnutrition problem .In addition, the study also identified some problems in the production of poultry. For example, a large number of educated unemployed persons were related to poultry farm. Farmers of these sectors faced various problems. To overcome the difficulties of poultry farming and to make production more profitable in the economy, the following recommendations were forwarded. Quality of poultry feed should be increased. The government should formulate national poultry development policy to sustain present growth of poultry production. Necessary steps should be taken by the government to provide adequate financial support to establish large scale farm. The government should offer price support to guarantee minimum level of profit. More research should be taken place to improve the quality of feed, vaccine, etc. Social security should be provided and awareness about poultry should be developed. The government should take steps to provide training among farmers about poultry rearing. The government and mass media should take initiatives to

reduce information gap so as to reduce diseases. The study therefore concluded that the economy of Bangladesh depended on agriculture to a great extent. With respect to nutrition, poultry meat and egg were excellent sources of protein and vitamin. The sector contributed greatly to income generation, women empowerment and nutritional improvement for the family.

Rahman (2015) made an attempt to find out the general condition of poultry farming in Mizoram based on primary data collected through his field survey on the management of broiler farms in Aizawl district of Mizoram. The study found that poultry farming has been a popular choice of vocation for small farmers. It is advantageous to such farmers as land and capital requirements are small. It starts returns with a regular income and it has potential for providing rural employment. It found that the estimated number of broilers available for consumption in the state during the year 2012-13 was 847,763 and net meat production was 1,561 tones. The per capita availability of broiler meat for the year 2012-13 was estimated at 1.39 kg per year. According to the study, the poultry sector in this state is unorganized and the marketing system is oriented neither to the producers nor to the consumers, but to the middleman. The study also observed during the survey that the farmers procured the chicks from local market of Aizawl city at the price ranging fromRs.40/-to Rs.50/- per chick while the price of feed varies from Rs.30/- to Rs.45/- per kg. It concluded that poultry sector helps in generating employment but the management system is not efficient to meet the ever increasing demand of the consumers. The mortality rate is found to be very high. In order to

enhance the productivity of the farms, the management practices needs to be improved. There is a major role for the extension workers to provide management information.

. *Sasidhar, et al*. (2015) studied the profitability of poultry farming in Karnataka and Andhra Pradesh. The case study evaluated integrated contract and non-contract broiler farming systems by applying Bennett's hierarchy of evaluation model. The overall findings indicated that though production cost was significantly low, the total returns were also significantly low in contract broiler farming (CBF) because surplus was largely taken by contract companies. This led to the conclusion that contract and non-contract farmers incurred significantly different production and marketing costs. The study also confirmed that CBF gave a lower but assured and almost fixed return. Despite low returns, farmers were participating in CBF largely because of low input costs, assured income and the absence of marketing risk. Nevertheless, in the absence of a regulatory body, the study found that all privileges and rights were in the hands of contract companies and that the agreements clearly favored the contract companies. The survey revealed that the value chain development and provision of inputs and extension advisory service (EAS) by large private poultry companies did not result in a win-win situation for both integrators and farmers. To make CBF profitable to the companies and to benefit farmers, the study suggested policy interventions including: further promotion and regulation of CBF farming through an authoritarian body; enhancement of rearing charges, increase in rate incentive norms etc.

CHAPTER – 3

OVERVIEW OF POULTRY INDUSTRY IN INDIA

CHAPTER-3

OVERVIEW OF POULTRY INDUSTRY IN INDIA

3.1. Introduction

Poultry industry has a crucial place in India as eggs and chicken meat are important and rich sources of protein, vitamins and minerals. Poultry provides rich organic manure and is an important source of income and employment to millions of farmers and others engaged in allied and ancillary activities in the poultry industry. Chicken is the most widely accepted meat in India. Unlike beef or pork, it does not have a religious taboo. The prices of chicken meat are lower than those of mutton and many Indian families, especially the educated people in urban areas have begun to accept eggs as a regular supplemental part of their vegetarian diet .The forecast surveys indicate that 'as the present younger generation moves to adulthood, the acceptability and demand for eggs and chicken meat in next two to three decades is likely to increase very rapidly'.

In the last two to three decades, poultry has made tremendous strides particularly in the private sector with the result that India is now self-sufficient with regard to the requirements of high quality breeding stocks, modern poultry equipment, availability of medicines and vaccines and technically qualified skilled manpower. As of 2000-2001, the annual growth rate has been 8-10% in

egg and 12-15% in the broiler industry. With an annual production of 33 billion eggs, India is the fifth largest egg producing country. It also produces 530 million broilers per year thus providing employment to about 2 million people.

However, despite these developments, the annual per capita consumption in India is only 33 eggs and 630 grams of poultry meat. This is much lower as compared to the world average of 124 eggs and 5.9 kg meat. The National Committee on Human Nutrition in India has recommended per capita of 180 eggs (about one egg every two days) and 10.8 kg meat. This signifies the tremendous scope for growth. With rapid urbanization and increasing demand from consumer market base (which was about 350 million in the year 2010), there is a bright future for poultry industry in India. It was estimated that Indian Poultry Industry contribution to the GDP was about Rs.400 billion in the year 2010.

3.2. Evolution of poultry farming in the world

The original habitat of the ancestor of modern breeds of fowl is South and Central India, the Himalayan Terrain, Assam, Burma, Ceylon, Sumatra and Java. There are four known species of wild fowls, namely, Red jungle fowl, Ceylon jungle fowl, Grey jungle fowl and Javan jungle fowl. The Red jungle fowl is widely distributed throughout Eastern India, Burma and Sumatra; the Ceylon jungle fowl in Ceylon; the Grey jungle fowl in South and Western parts of India, the Javan jungle fowl in Java and adjacent islands. All four species have been breeded with one another and most of the modern breeds have

descended from these four wild species. The sport of cock fighting has important influence in the domestication as well as distribution of fowls throughout the world[1].

As civilization developed, the use of indigenous fowls progressed from cock fighting to utility purposes. The ever increasing population of the world and the consequent high demand for food grain necessitated substitutes for agricultural crops for subsistence. This led to improving and developing varieties of fowls for utility purposes. Presently, there are more than 100 breeds of fowls with distinct features of which only a few are reared for the purpose of egg and meat on commercial scale.

The transformation of backyard jungle fowl into modern utility fowl was a slow but a significant process in the development of poultry farming in the world. In 1952, Bennet proved that the laying strength vary from flock to flock and paved the way for specialization in fowls rearing. In 1912, Pearl found that egg production can be increased through generic line marking the beginning of line breeding system. The findings of Hay in 1924 about the inheritance and maturity of birds added to the knowledge of line breeding for selecting the parent stock, which is the nucleus of hatching day old chicks[2].

An organized approach in poultry industry was first introduced in the United States of America by the 'American Poultry Association' in 1873. Commercial broiler production today had its beginning in the United States in

[1] Jull, M.A. (1982), '*Poultry Husbandry,'* TMH Publications, New Delhi.
[2] Lasley John, F. (1963), '*Genetics of Livestock Improvement,'* Allyn and Beacom, Inc.

1920's although broiler poultry was produced in limited quantities as early as 1880. The world's most intensive commercial broiler poultry area had its beginning in 1923 in Delmarra peninsula. By 1927, broilers were produced extensively in many of the states in the United States of America[3].

3.3. Poultry farming in the world

Poultry farming is carried out to some extent in all countries. In countries like the United States, Canada, Australia, European countries and China, poultry industry is regarded as an integral part of agriculture. Though the leading commercial poultry producers are the USA, Russia and China, the adoption of contemporary scientific developments in the field of hatching, rearing, marketing, etc. has led to considerable advancements in poultry farming worldwide.

Poultry egg production in the world

According to the Food and Agricultural Organization (FAO), world egg production will reach a record 65.5 million tonnes in 2013. Between 2000 and 2010, global egg output increased by more than 2% per year. This resulted in an increase from 51 million tonnes to 63.8 million tonnes (Table 3.3.1). Since then, the annual increase averaged just one per cent, marking a decline.

[3] Iyer, S.G. (1956), '*Improved Indigenous Hen Evolved by Selective Breeding,'* Indian Veterinary Journal.

Table 3.3.1

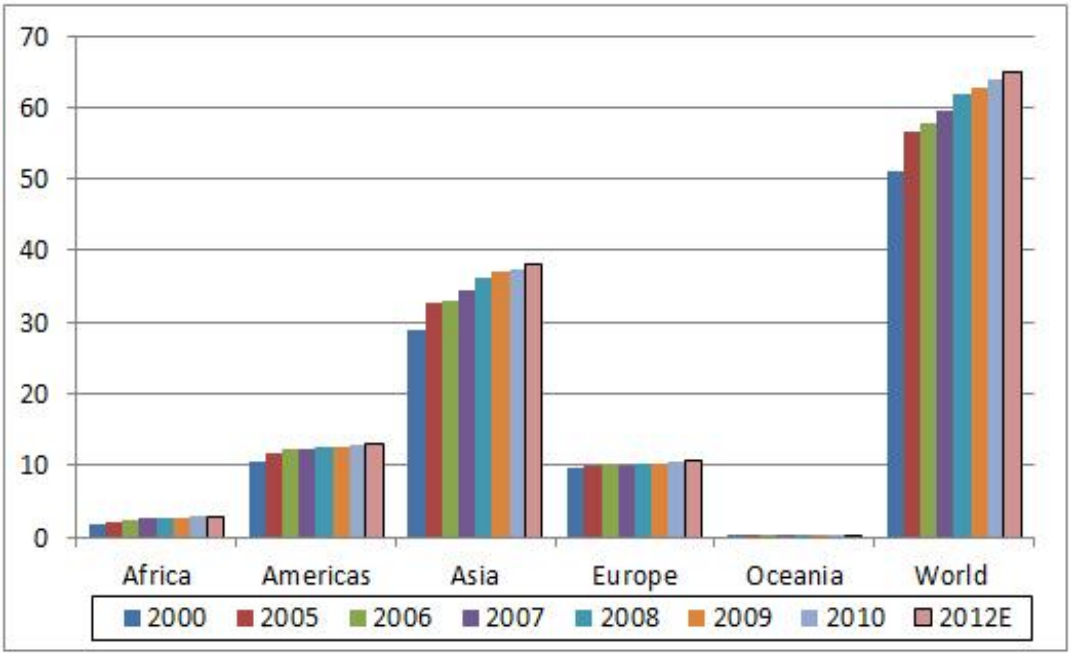
Table 1. World egg production (million tonnes)

Region	2000	2005	2006	2007	2008	2009	2010	2012E
Africa	1.9	2.2	2.4	2.5	2.6	2.6	2.8	2.9
Americas	10.4	11.7	12.3	12.3	12.5	12.6	12.8	13.1
Asia	29.0	32.6	33.0	34.5	36.2	37.2	37.4	38.1
Europe	9.5	9.9	10.1	10.0	10.2	10.3	10.5	10.6
Oceania	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
WORLD	**51.0**	**56.6**	**57.9**	**59.6**	**61.8**	**62.8**	**63.8**	**65.0**

Source: FAO to 2010; 2012 = author's estimates

Annual rates of growth vary between the regions (Table 3.3.1 and Figure 3.3.1). For instance, while there was an increase worldwide between 2000 and 2010 of 2.3 per cent a year, Africa showed an average annual increase of 3.7 per cent. Asia had an annual growth of 2.6 per cent, and the Americas and Oceania had over two per cent. Expansion was slowest in Europe with an increase of only 1.1 per cent. Thus, there has been a shift in poultry egg production from Europe and the Americas to Asia and Africa.

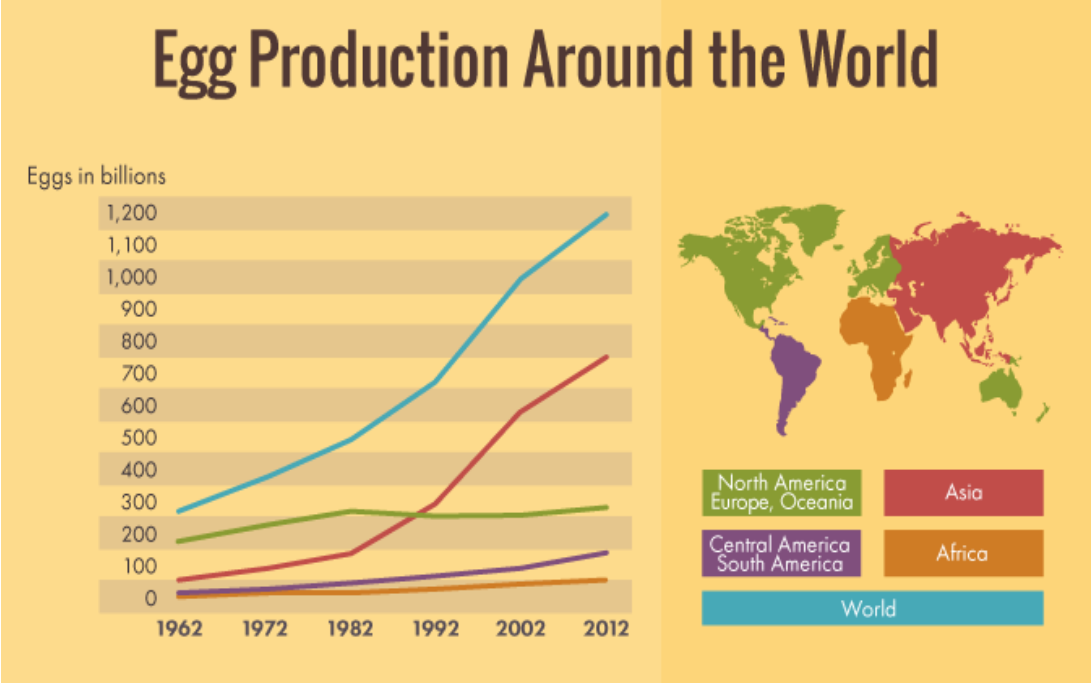
Figure3.3.1: World egg production by region (million tonnes)



Source: FAO, 2012

As a result of these differences, Africa managed to increase its share of global production from 3.8 per cent to 4.3 per cent. The contribution from the Americas has declined from 20.4 per cent to 20.1 per cent, while Asia has increased its share from 56.9 per cent to 58.7 per cent. Europe's share contracted from 18.6 per cent to 16.5 per cent. Thus, in general, there is an increase in production and market share in Asia and Africa, stagnant growth in the Americas and a reduction in Europe. This trend is illustrated in the graph 3.3.2.

Figure3.3.2: World egg production by region



Source: FAO, 2012

Poultry meat production in the world

According to the Food and Agriculture Organization (FAO), the annual growth in global poultry meat production is a little under two per cent. For instance, the estimate of global output in 2012 by FAO is at 103.5 million tonnes (Table 3.3.2). This represents an increase in poultry's share of global meat production to a record 34.3 per cent.

Table 3.3.2

Table 1. World poultrymeat and chicken meat production by region (million tonnes)

World poultrymeat production

Region	2000	2005	2006	2007	2008	2009	2010	2011E	2012F
Africa	3.0	3.6	3.6	4.0	4.2	4.4	4.6	4.8	4.9
Americas	30.1	35.9	37.0	38.9	41.1	40.1	41.8	42.8	43.0
Asia	22.9	27.3	28.3	30.1	31.8	32.9	34.5	36.1	37.4
Europe	11.9	13.2	13.1	14.0	14.4	15.7	16.1	16.6	16.9
Oceania	0.8	1.0	1.0	1.0	1.0	1.0	1.1	1.3	1.3
WORLD	**68.6**	**80.9**	**83.0**	**87.9**	**92.5**	**94.2**	**98.1**	**101.6**	**103.5**

World chickenmeat production (million tonnes)

Region	2000	2005	2006	2007	2008	2009	2010	2011E	2012F
Africa	2.8	3.4	3.4	3.7	4.0	4.2	4.4	4.6	4.7
Americas	27.2	32.7	33.7	35.3	37.4	36.7	38.4	39.2	39.4
Asia	18.7	22.5	23.5	24.9	26.4	27.2	28.6	29.9	31.0
Europe	9.4	10.7	10.8	11.7	12.1	13.4	13.8	14.2	14.5
Oceania	0.7	0.9	1.0	1.0	1.0	1.0	1.1	1.3	1.3
WORLD	**58.7**	**70.2**	**72.3**	**76.7**	**80.8**	**82.5**	**86.2**	**89.2**	**90.9**

E=estimate; F=forecast
Source: FAO

Increases in poultry consumption are primarily linked to four key factors namely- population growth, improvements in incomes, chicken prices relative to those for competitive meats and dietary preferences. Global poultry meat consumption is forecast to increase by 1.7kg per person from around 13.2kg to in 2013 to 14.9kg in 2023. Consumption data compiled by the FAO reveal that global poultry meat consumption has increased from 11kg per person in 2000 to a record 14.4kg in 2011.

Table 3.3.3. Poultry meat consumption (kg/person/year)												
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Africa	4.3	4.4	4.5	4.7	4.7	4.7	4.8	5.2	5.5	5.6	6.1	6.2
America	31.5	31.8	32.8	33.1	34.7	34.1	35.3	36.0	37.1	35.9	37.6	38.6
Asia	6.6	6.6	6.7	7.0	7.0	7.4	7.6	8.1	8.5	9.0	9.2	9.4
Europe	15.9	17.8	18.5	18.2	19.0	19.2	19.2	20.2	21.3	21.7	21.4	21.7
Oceania	30.1	30.1	32.2	33.5	33.4	35.6	35.7	36.8	35.4	35.6	37.4	42.1
World	11.0	11.2	11.6	11.8	12.0	12.2	12.5	13.1	13.6	13.7	14.1	14.4

Source: FAO, 2012

Over the past 12 years, chicken meat has increased its share of world poultry meat production from about 86 per cent to the current estimate of almost 88 per cent. Global chicken meat output increased by 27.5 million tonnes between 2000 and 2010. Although the rate of expansion has declined since then, output in 2012 totaled around 91 million tonnes and 93 million tonnes in 2013.

The five major regions shown in Table 3.3.2 have shown different rates of growth. Between 2000 and 2010, both Africa and Asia have recorded increase of around 4.5 per cent a year. Growth in the other regions has been below four per cent averaging 3.9 per cent in Europe and 3.5 per cent in the Americas. Since 2010, all the regions have shown slower growth rates. This reflects lower profitability due to higher costs (principally feed) while in some countries, disease outbreaks have also played a role.

3.4. Evolution of poultry farming in India

History testifies the dominance of India in poultry even during 1000 B.C. There are evidences in history that fowls and eggs were exported to Persia, Palestine, Greece, etc. during 500 B.C. India was a dominant supplier of fowls to South Africa, Australia, Japan and Russia and it continued for centuries. The fowls supplied during these periods were local in nature and were reared under very primitive methods[4]. For centuries, the rural population of India, mainly the women had been rearing the indigenous fowls under primitive methods, for domestic consumption with little business motive.

The first missionary poultry farm was set up in Uttar Pradesh in 1907. The next farm was set up by the British under the name 'SPARRIN' in 1912 but it was closed in the year 1923 because of poor turnover[5]. Mr. A.E. Slater first introduced exotic breeds in the country at the Mission Poultry Farm in Uttar Pradesh in 1930. With the opening of Imperial Veterinary Research Institute at Izatnagar in Uttar Pradesh in 1939, and the starting of a few large layer poultry farms with improved varieties of fowls by the military authorities during World War II, poultry farming began to be popularized in India[6]. Poultry farming with scientific methods was introduced in India when the Ministry of Defence, Government of India started poultry farms with highly

[4] Kochugovindan, Unni (1972),' *Poultry Science - Principles and Practice*,' State Institute of Languages, Thiruvananthapuram, P.71.
[5] De Valols, J.J. (1943), *'Poultry in India,'* P.11.
[6] '*Handbook of Animal Husbandry,'* I.C.A.R. Publications, New Delhi, 1962, P.95.

improved varieties of fowls[7]. The poultry sector achieved great progress during the 1960s when private sector farms were allowed to import pure line breeds.

3.5. Poultry development in India in various decades

A modest beginning towards commercial poultry farming was launched in a pilot project in Orissa in the beginning of 1950. During this period, 33 extension centers were started in different parts of the country to supply improved breeds of layer fowls to interested farmers[8].

During the middle of 1950s, the Orissa pilot project was developed into an all India Poultry Development Project to encourage backyard rearing in rural areas with improved varieties of fowls and to popularize layer poultry farming on commercial scale in urban areas. This was the first large scale organized effort towards modern poultry farming in the country. Five regional poultry breeding farms were established in various parts of the country to have genetically superior varieties of fowls from the parent stocks imported from USA, under the Technical Co-operation Mission. But the programme did not turn up well due to the lack of marketing facilities and other infrastructural disabilities.

Through the adaptation of scientific rearing systems and practices like deep litter housing, balanced feeding, preventive vaccination, etc., poultry farming emerged as a commercially viable enterprise in the 1960s. It was during this period that the intensive egg and poultry 'production-cum-

[7] Chowdary (1990), '*Profile of Poultry Industry in India,'* Indian Poultry Industry Year book.
[8] Singh, R.A. (1985), '*Poultry Production,'* Kalyani Publishers, New Delhi.

marketing programme with an area development and package approach' was introduced.

This was considered a landmark in poultry development in India[9]. The entry of National and International agencies like the United States Agency for International Development, Applied Nutrition Programme, Freedom from Hunger Campaign, the United Nation's Development Programme etc., gave momentum to the growth of commercial layer poultry farming in the country. This period witnessed dramatic growth in the number of layer poultry farms with improved breeds of fowl and the beginning of broiler poultry farms in few centers in the country. The setting up of franchised hatcheries in private sector, import of pure line breeds from Australia, functioning of two large scale poultry processing plants etc. were behind the successful implementation of programmes during this period.

In the beginning of the 1970s, thrust was given to expansion of poultry marketing facilities. The permission to breed layer and broiler chicks in private hatcheries and the launching of modern poultry complex at Hessargetta attracted many challenging entrepreneurs into the field. By the middle of 1970s, efforts were made to improve the quality of basic inputs needed for successful poultry farming and to establish proper poultry marketing network in the country. It also gave special emphasis for broiler poultry farming and its development. The beginning and the functioning of National Poultry

[9] Gupta, R.C. (1971), '*Poultry Farming in India,'* Poultry Guide Vol. VII.

Development Board and many State Poultry Development Corporations were made during this period.

It was during the middle of the eighties that the government made sufficient provision for the research and development in poultry sector, with special emphasis on poultry meat processing. The developments in poultry sector today are the outcome of the active involvement of private entrepreneurs and government agencies in the country. The government investment in poultry sector during the plan periods amounted to Rs.1572.00 million against the total expenditure of Rs.26, 609.40 million in livestock sector (Table 3.5.1).

Table 3.5.1			
Five Year Plan Expenditure on Livestock and Poultry (in million Rs.)			
Plan Period	**Expenditure on Livestock**	**Expenditure on Poultry**	**Expenditure on Poultry as percent of Livestock**
First Plan	160.00	25.00	15.62
Second Plan	334.70	28.00	8.37
Third Plan	770.00	46.00	5.97
Annual Plan	597.00	-	-
Fourth Plan	1542.60	115.00	7.45
Fifth Plan	2324.60	355.00	15.27
Annual Plan	2087.70	-	-
Sixth Plan	8025.10	426.00	5.31
Seventh Plan	10767.70	577.00	5.36
Total	26609.40	1572.00	5.91

Source: Planning Commission Report

The beginning of 1990s witnessed a transition in poultry farming. The phenomenal expansion in broiler production compelled layer poultry farmers and private layer hatcheries to shift to broiler fowls because of its relative financial advantage. This gestation period showed visible variations in the movement of layer parent stock, layer feed production and egg production whereas the broiler poultry business in the same period was growing up gradually.

The growth of hatcheries indicated the expansion and growth of poultry business in the country. While looking at the number of hatcheries in India since 1990, it was found that the number of poultry hatcheries in the private sector declined in the beginning. This was due to the decline of layer poultry farming in many states and the time lag for converting the layer poultry farms into broiler poultry farms. However, the timely intervention of government by starting new public sector layer hatcheries gave a balanced development in the layer poultry sector. It also helped to reduce the hardships of private layer poultry farmers in India.

Broiler today has emerged as the fastest growing segment of the poultry industry. Broiler poultry production in India is not scattered across the country but concentrated in certain 'pockets'. The mode of rearing, though intensive in nature, varies from region to region. In the early eighties the commercial broiler production was mainly confined to the northern and western regions which together accounted for over 70 percent of the total

output[10]. Since then, broiler production has spread widely with new centers of growth in South India which accounts for about 38 percent of the country's output. As a peculiarity, the western region is concentrating on contract growing whereas the northern region is focusing on integrated broiler projects. The southern region, where expansion of broilers is very fast, follows intensive rearing methods in the major poultry pockets. The eastern region with a slow growth in the past is coming up by adopting intensive rearing practices in the major poultry pockets.

In 2012, the UN Food and Agricultural Organization ranked India the sixth largest chicken meat producing country and the third largest egg producing country. Poultry meat and egg production have grown steadily over the past several years. India's poultry meat production increased 8% in 2012-13 compared to 2011-12. In the 2012 All India Livestock Census, total poultry grew from 649 million birds to 729 million birds, an increase of 12% over the last census taken in 2007 (Figure 3.5.1).

[10] Joseph, K.X. (1988), '*Finance Management in Broiler Poultry farms,'* M.Phil. Dissertation, Cochin University of Science and Technology, P. 47.

Figure 3.5.1

Poultry Meat Production (000 Tons)

	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Poultry Meat	1,755	1,884	2,087	2,193	2,483	2,682
% Change		7%	11%	5%	13%	8%

Source: India Ministry of Agriculture, Department of Animal Husbandry, Dairying and Fisheries, State Animal Husbandry Departments

All India Livestock Census in thousands

	2003	2007	2012	% Change 2012/2007
Fowls	457,399	617,734	692,646	12%
Ducks	29,959	27,643	23,539	-15%
Turkeys & Others	1,654	3,452	13,025	277%
Total Poultry	489,012	648,829	729,209	12%

Source: India Ministry of Agriculture, Department of Animal Husbandry, Dairying and Fisheries

Source: FAO, 2012

Egg production is targeted to reach 72.9 billion eggs in 2013-14, up almost 5% from the previous year and 21% higher compared to 2009-10. In 2012-13, egg production totaled 65.6 billion (Figure 3.5.2). If a hen lays more than 100 eggs in a year then it is categorized as “improved” hen or else it is categorized as “desi”.

Figure 3.5.2

Estimated Egg Production of Desi, Improved Fowls and Ducks in billions

	2009-10	2010-11	2011-12	2012-13	2013-14*
Andhra Pradesh	19.4	20.1	21.2	22.3	22.3
Tamil Nadu	10.8	11.5	11.9	11.9	12.6
Others	30.0	31.4	33.3	35.5	38.1
All India	60.3	63.0	66.4	69.7	72.9

*Physical Target

Source: Basic Animal Husbandry & Fisheries Statistics 2013 Government of India, Ministry of Agriculture Department of Animal Husbandry, Dairying and Fisheries, State Animal Husbandry Departments

Top production - eggs, hen, in shell - 2012

Rank	Area	Value ($1000)	Metric Tons
1	China*	20,320,030	24,500,000
2	U.S.	4,507,868	5,435,168
3	India	2,985,800	3,600,000

Top production, meat, indigenous, chicken 2012

Rank	Area	Value ($1000)	Metric Tons
1	U.S.	24,269,046	17,038,000
2	China*	18,043,178	12,667,151
3	Brazil	16,506,226	11,588,139
4	Russia	4,670,639	3,279,006
5	Mexico	3,973,383	2,789,500
6	India	3,160,804	2,219,031

*China, mainland

Source: http://faostat.fao.org/site/339/default.aspx

Source: FAO, 2012

India today is a major exporter of egg products. India's exports of liquid/frozen/dried whole eggs and egg yolks grew rapidly, from 6,685 metric tons in 2009 to 10,149 MT in 2013. The exported value in 2013 was $48.7 million, up from $26.6 million in 2009 (Figure 3.5.3).

Figure 3.5.3

India: Egg Product Exports (HS0408) in metric tons

	2009	2010*	2011	2012	2013	% chg
Germany	1,607	983	1,621	1,827	2,281	25
Indonesia	1,091	938	1,084	1,500	1,648	10
Japan	556	444	832	778	1,336	72
UAE	238	180	437	1,010	1,221	21
Denmark	566	808	602	1,118	832	-26
Saudi Arabia	297	329	468	750	777	4
Netherlands	372	825	416	1,607	550	-66
Viet Nam	257	322	346	349	505	45
Others	1,701	616	876	807	999	24
World	6,685	5,445	6,682	9,746	10,149	4

*2010 quantities are estimated by UNSD.

India: Egg Product Exports (HS0408) in '000 USD

	2009	2010	2011	2012	2013	% chg
World	26,577	27,848	29,868	39,967	48,654	22

Sources: ITC calculations based on UN COMTRADE statistics.

Source: FAO, 2012

India's 2016 broiler production is projected to increase by approximately eight percent to 4.2 million tons as demand rises from the growing middle class, according to the USDA's Foreign Agricultural Service (FAS) report**.** Production methods have changed in the last ten years, as producers have embraced the integrator production model. The report said that approximately 60-70% of all operations used the integrator model, while the remainders were smaller backyard operations. After the birds had been raised to slaughter weight, they were either bought by the integrators for slaughter and processing, or were sold to middle men who in turn sold them at live markets. The live poultry market today constituted 90 to 95% of total sales since consumers preferred freshly culled chicken meat.

Chicken prices had slowly risen in the last few years due to increased feed prices and other costs. Processed chicken meat constituted about 5-10% of

total chicken meat production, with an estimated demand for processed chicken meat growing between 15-20% per year, as the middle class grew. India's per capita consumption of poultry meat is estimated at around 3.1 kg per year, which is low compared to the world average of around 17 kg per year. However, consumption is growing with 2016 total chicken meat consumption forecasted at 4.19 million tons, up by approximately 8% over 2015. The FAS expected 2016 layer production to reach 80 billion eggs, up 5% from last year.

3.6. Profile of Mizoram

Mizoram became the 23rd state of the Indian Union on 20th February, 1987. It is the fifth smallest state in India and one of the seven states of North-East India. It's location on the globe is latitude (degree) 21°58' to 24°35' north and longitude (degree) 92°15' and 93°29'east, covering an area of 21,087 sq. km (0.64% area of India). It is flanked by Myanmar in the east and south, Bangladesh in the west, Assam and Manipur in the north and Tripura in the west. The state is divided into 8 districts and 3 Autonomous districts. The capital city is Aizawl which is connected by air and by NH-54 via Silchar (Assam).

The economy of Mizoram is dominated by the agricultural sector which employs about 55 to 60 % of the working population. Attempts have been made for the growth and development of the industrial sector as it enjoys a unique location- specific advantage by offering gateway for the engagement of international trade with South East Asian countries.

Taking into account the hilly terrain of the State with its underdeveloped infrastructure and limited entrepreneurship of the people, there is limited scope for the development of large-scale industries. Micro, Small and Medium Enterprises (MSME) therefore offers tremendous scope of production and employment. The thrust areas for industrial development according to the New Industrial Policy, 2012 adopted by the government are described below:

i. Bamboo based industries.

ii. Food processing industries.

iii. Handloom & Handicrafts.

iv. Mines & Mineral tourism.

v. Animal & Poultry industries.

vi. Packaging industries.

vii. Entertainment/Music industries, and

viii. Plantation based industries.

3.6.1. Livestock & Veterinary

Animal Husbandry & Veterinary Sector plays an important role for increasing production of animal-origin food like milk, eggs & meat as well as socio economic development of the State. It contributes substantially to the State Gross Domestic Product (GDP). For the development of this sector, various

schemes under State Plan and Centrally Funded Schemes are taken up for further promotion of livestock development, induction of improve germplasm for up-gradation of local stock, provision of technology to farmers for improved animal husbandry practices, and provisions of animal health care.

Table 3.6.1: Livestock and Poultry Population

Species	Livestock Census 2003	Livestock Census 2007	Growth Rate (%)	Remarks
1	2	3	4	5
Livestock	3,17,000	3,64,000	14.1	Pigs constitute the largest group followed by cattle
Poultry	11,18,548	12,41,814	11.02	Fowls account for 99.3% of the total population

Source: Economic Survey Mizoram 2012

3.6.2. Livestock Products

Egg Production: The estimated total egg production during 2011-2012 was 349 lakhs of which 262 lakhs were Desi and 87 lakhs were Improved variety. The total egg production is estimated to have decreased by 10.05 percent from the previous year. The recommendation made by nutritional experts is 180 eggs per

year for an individual to maintain good health. Per capita availability of eggs in Mizoram during 2011-2012 was worked out to be 32 eggs per year (Table: 3.6.2)

Table 3.6.2: Estimated Egg Production in Mizoram (in lakhs nos.)

Year	Desi	Improved	Total
1	2	3	4
2006-07	204	144	348
2007-08	229	173	402
2008-09	236	175	411
2009-10	191	180	371
2010-11	203	185	388
2011-12	262	87	349

Source: Economic Survey Mizoram 2012

Meat Production: The total production of meat from Cattle, Buffaloes, Mithun, Goats and Pigs during 2011-2012 was estimated at 10,957 tonnes of which pork and beef accounts for 7,393 and 3,364 tonnes respectively. Meat production from chicken broiler during 2011-2012 was estimated at 2,201 tonnes. Out of the total meat production (including broiler meat), pork accounted for the highest quantity with 56.19 % followed by beef with a share

of 25.57 % and broiler meat accounting for 16.73 % of the total meat production (Table: 3.6.3)

Table 3.6.3: Estimated Poultry Meat Production in Mizoram (in tonnes)

Year	Poultry
1	2
2006-2007	1492
2007-2008	2000
2008-2009	2236
2009-2010	1451
2010-2011	1762
2011-2012	2201

Source: Economic Survey Mizoram 2012

However, despite the great strides made in poultry production, demand still outweighed supply especially in egg consumption. This is illustrated in Table: 3.6.4.

Table 3.6.4: Demand Gap of Major Livestock Products for 2011-12

Sl.No	Item	Requirement According to ICMR	Availability	Demand Gap
1	2	3	4	5
1	Meat	13,965 tonnes	13,158 tonnes	807 tonnes
2	Eggs	1,964 lakh nos.	349 lakh nos.	1,615 tonnes

Source: Economic Survey Mizoram 2012

Chapter 4

Empirical and Performance Analysis of Poultry Farmers in Samtlang

Chapter-4

Empirical and Performance Analysis of Poultry Farmers in Samtlang

4.1. Introduction

Poultry farming has been a popular choice of vocation for small farmers in Mizoram. It is advantageous to such farmers as land and capital requirements are small, it starts returns with a regular income and it has potential for providing rural employment.

Poultry development in Mizoram has taken a new turn in the late eighties with establishment of broiler farms in various places. Though there is no large scale poultry industry in Mizoram, almost 70 per cent of the farmers keep poultry for subsidiary income. The estimated number of broilers available for consumption in the state during the year 2012-13 was 847,763 and net meat production was 1,561 tones. The per capita availability of broiler meat for the year 2012-13 was estimated at 1.39 kg per year (Integrated Sample Survey, 2012-13).

As per the current available study, poultry sector helps in generating employment. The broiler management system however is not efficient to meet the ever increasing demand of the consumers. The mortality rate is found to be

very high. To enhance the productivity of the farms the management practices needs to be improved. There is a major role for the extension workers to provide management information through training, farm visits, to improve the knowledge level of the farmers in order to enhance profitability and productivity of broiler farms. The marketing system for broilers is disorganized. The middleman and commission agents control the marketing system. And there is an urgent need to form cooperatives or common interest groups to prevent the exploitation of the farmers.

Mizoram in the past was completely dependent on the small-scale production of poultry to meet the consumption requirements of chicken meat and table eggs, with eggs being imported to satisfy the market requirements. The commercial poultry industry has undergone rapid development in recent years. This can be primarily attributed to:-

1. The introduction of contractual cum vertical integration farming; shortage in the supply of competitive products (red meat).
2. High prices of competitive products compared to the production cost of poultry.
3. Low level of capital investment required by poultry enterprises compared to other agricultural projects.
4. Good profits and quick turnover of capital.
5. The growing role of companies specialized in importing production inputs and selling them to small farmers.

6. The role of the government, including access to agricultural credit, extension and health services, and production/distribution of multi-purpose chicks, and
7. Favorable climate for low cost poultry production.

As a result, poultry production in Mizoram has achieved a high level of self sufficiency. According to the Economic Survey Mizoram 2013-14, the estimated total egg production during 2012-2013 was 351 lakhs of which 258 lakhs were desi and 93 lakhs were improved variety. The total egg production is estimated to have increased by 0.57 percent from the previous year. The recommendation made by nutritional experts is 180 eggs per year for an individual to maintain good health. Per capita availability of eggs in Mizoram during 2012-2013 was worked out to be 31 eggs per year. Meat production from chicken broiler during 2012-2013 was estimated at 1,561 tonnes. Broiler meat accounted for 12.97 percent of the total meat production.

However, the demand of meat has increased over time owing to cheap rate and high quality protein required to maintain good human health. Therefore, there is a dire need to facilitate and promote poultry production in Mizoram to provide quality protein at low rates to the general masses. In spite of efforts being made to improve poultry production, the net return in poultry production is still minimal. The present study was conducted to overview the existing poultry production system in Samtlang village with emphasis on the estimation of cost of production and returns to poultry producers.

The proposed study will try to examine the problem of employment and livelihood condition of poultry farmers in Samtlang cluster with the following objectives in mind:-

1. To assess the profitability of poultry farming through cost and return of poultry farming.
2. To identify the problems and constraints associated with poultry farming.
3. To suggest possible solutions for those problems.

This chapter has therefore been divided into:-

I. Materials and Methods.

II. Results and Discussion, and

III. Economic Analysis of Poultry Farming.

4.2. Materials and Methods

1. Universe:

   The study was based on primary data collected from the poultry producers of Samtlang and its clusters in Aizawl. The said cluster was selected for having large number of the poultry farms. Before launching the survey, the questionnaire was pretested and improved accordingly.

2. Sampling method:

   A good survey sample should have both a small sampling error and minimum standard error. This can be achieved if one has unlimited resources. However, given the constraints of finance, time and data management, compromises have to be made in selecting the sample size. Thus, given the limitations, Simple Random Sampling using a Random Number Table was employed where a sample size of 30 poultry farms engaged in poultry production was selected from a population of 50 households. Additionally, 10 retailers and 15 consumers were also interviewed for getting a realistic view about existing marketing system of poultry.

3. Analytical technique:

   Production of farm commodities involves numerous relations between resources and commodities. Some of these relationships were simple while the others were complex. In this study, the production function was limited to analyze the data as required by the adopted hypothesis. This study is based on field level primary data collected from selected

farmers through field survey method. We have followed interview survey method using questionnaire to collect data from respondents to fulfill the objectives of the study. The selected farmers were interviewed about cost and return that comes from their farm. In this study October of the year 2016 was considered as sample time duration.

- To calculate Net Return, the following formula is used-

  $$Net\ return = GR - GC$$

  where,

  GR=Gross Return and

  GC=Gross Cost

  $$GC = TFC + TVC$$

  where,

  TFC=Total Fixed Cost and

  TVC=Total Variable Cost.

- To calculate Benefit-Cost ratio, the following formula is used-

  Benefit-Cost ratio = Gross Return (GR)/Gross Cost (GC)

  Gross Return includes the average return from the main product. Gross Cost includes Total Fixed Cost and Total Variable Cost. Benefit-Cost ratio is a relative measure which is used to compare benefit per cost. It helps to analyze the financial efficiency of the farms.

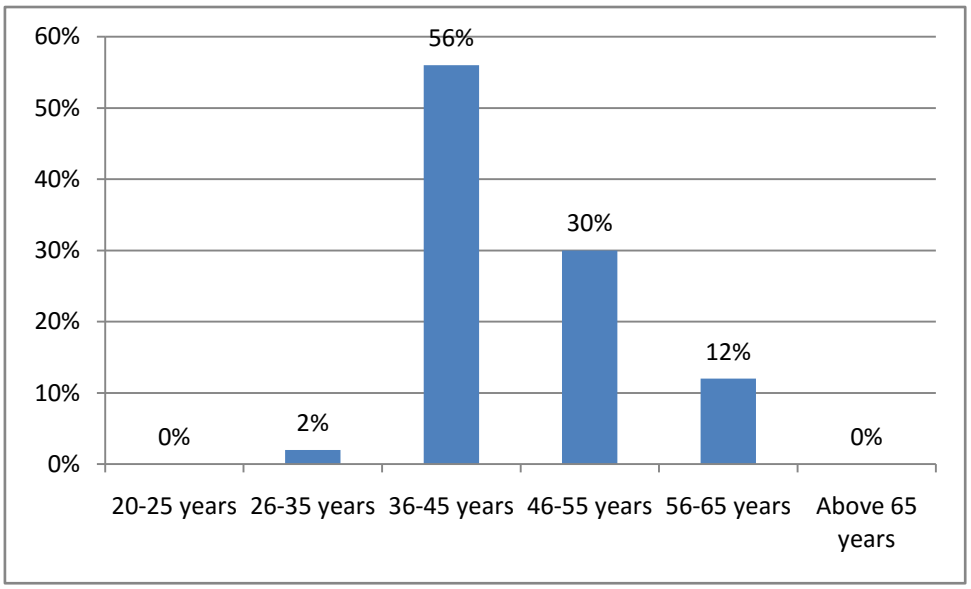
4.3. Results and Discussions

The main objective of this chapter is to describe the demographic and socioeconomic characteristics of the studied poultry farmers including their age, education and farming experience. In addition, farm characteristics such as involvement in poultry farming and access to institutional credit have also been described.

1. *Age of the respondents:*

   The data on age group of the sampled poultry farmers revealed that 56% respondents fall in the age group of 36-45 years, 30% in the age group of 46-55, 12% in the age group of 56-65 years, and 2% respondents fall within the age group of 26-35 years.

Figure 4.3.1: Age of Respondents

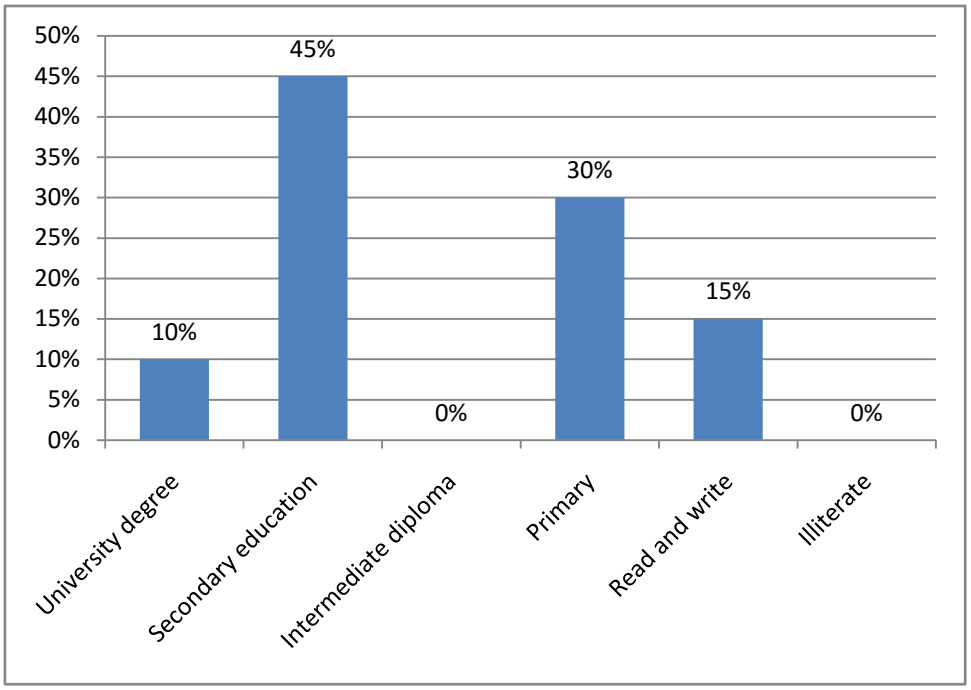


Source: Field Survey, 2016.

2. *Education level:*

About 45% of the respondents had Secondary education, 10% had University degree, 0% had Intermediate diploma while the percentage of Primary, Read and Write and Illiterate was 30%, 15% and 0%, respectively.

Figure 4.3.2: Education of Respondents

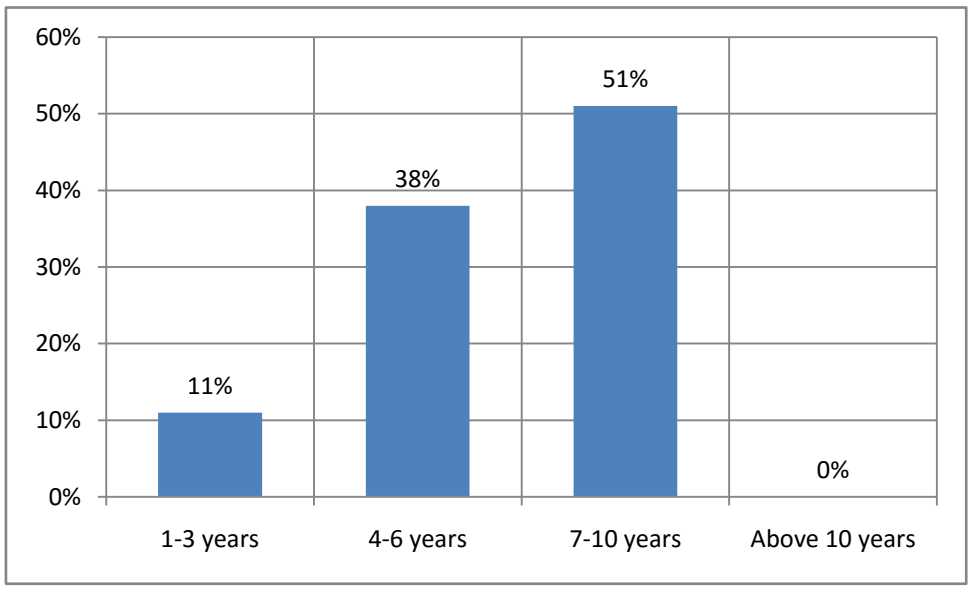


Source: Field Survey, 2016.

3. *Poultry farming experience:*

About 51% of the respondent farmers had poultry farming experience of 7-10 years. This was followed by 38% and 11% of respondents who had experience of 4-5 and 1-3 years, respectively.

Figure 4.3.3: Experience of Respondents

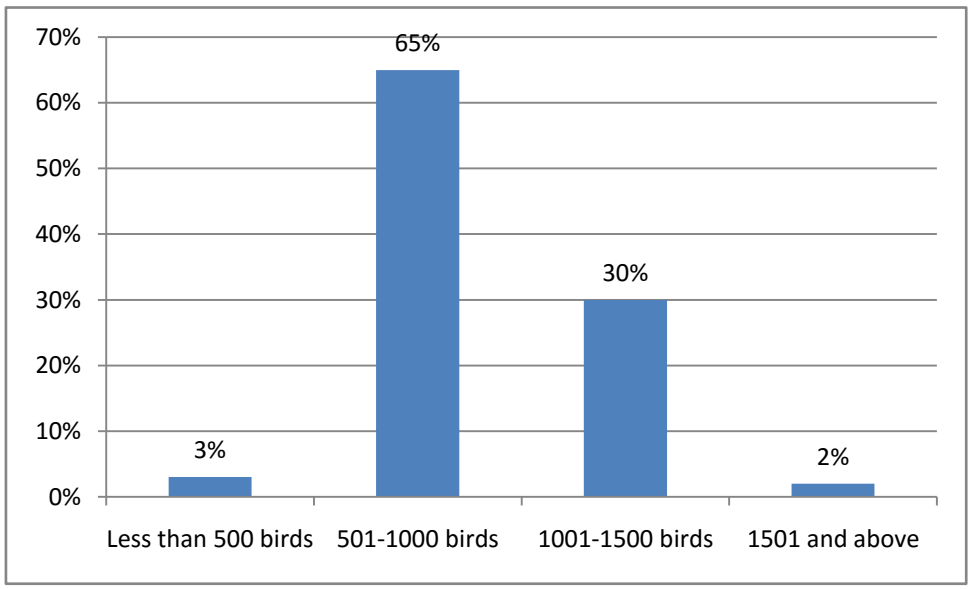


Source: Field Survey, 2016.

4. *Scale of poultry business:*

In order to examine the resource management and its impact on productivity and sustainability, the Poultry producers were divided into four groups on the basis of number of birds: a) Less than 500; b) From 500-1000 ; c) from 1001-1500 ; and d) from 1501 and above. The results revealed that 65% of the respondents belonged to group (b); 30% respondents were in group (c); and 5% of the respondents were in group (a) and (d).

Figure 4.3.4: Scale of Business

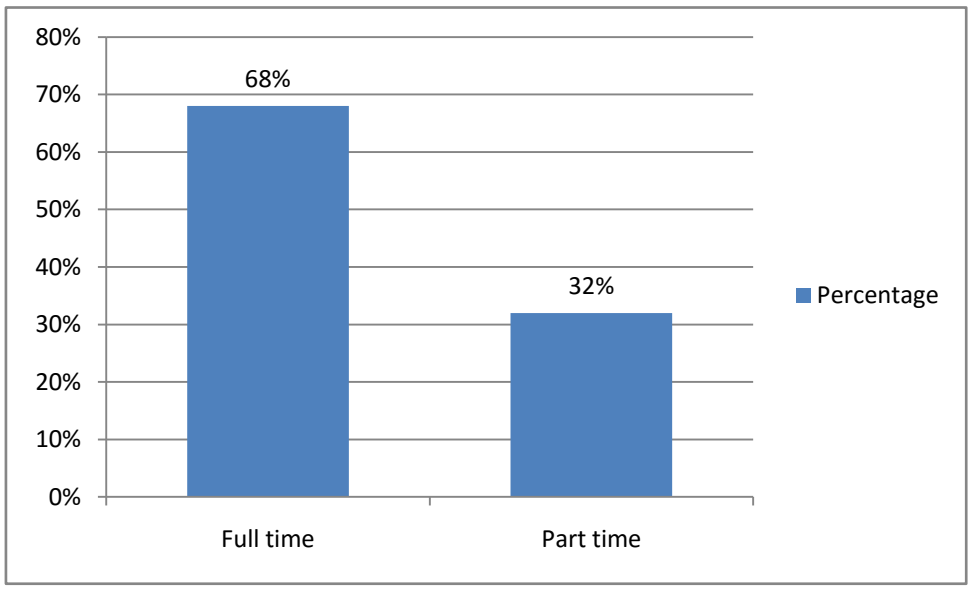


Source: Field Survey, 2016.

5. *Business commitment:*

About 68% belonged to full-time whereas 32% belonged to part-time business commitment. The study found that the poultry farms were primarily owned and operated by the male head whereas the contributions of women were either negligible or at best supplementary.

Figure 4.3.5: Business Commitment

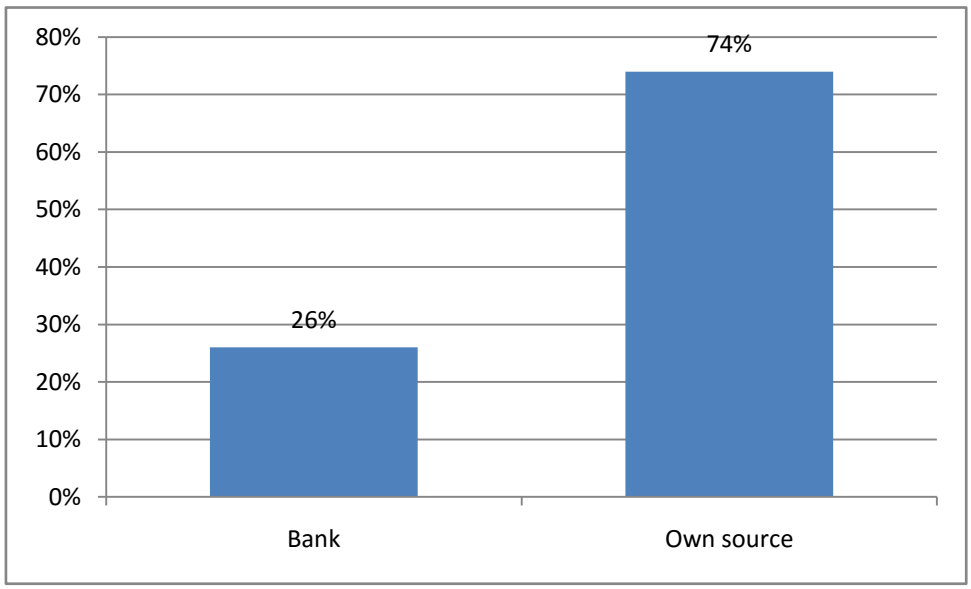


Source: Field Survey, 2016.

6. *Access to credit:*

Access to credit is an important instrument that enables farmers to acquire working capital and inputs. Credit availability for small farmers is one of the main indicators of rural development. But in case of poultry farming, only about 30% availed the institutional credit from bank, while 70% did not borrow loan from any bank. It was also found that 80% respondent farmers purchased the feed on credit from the feed dealers and the remaining percent purchased it on cash. Of the farmers who purchased poultry feed on credit, about 40% reported shortage of requisite capital while the remaining 60% viewed it as routine of poultry farming business.

Figure 4.3.6: Credit Access



Source: Field Survey, 2016

7. *Labor utilization*:

Poultry sector can generate employment by using family labor as well as hired labor. The survey also collected information of labor use for poultry production activity. Table 4.3.1 presents the information of labor utilization of contract poultry farm. It appears from the Table that total labor man-days per farm were 505 of which 39 per cent man-days was family labor and 61 per cent man-days was hired labor.

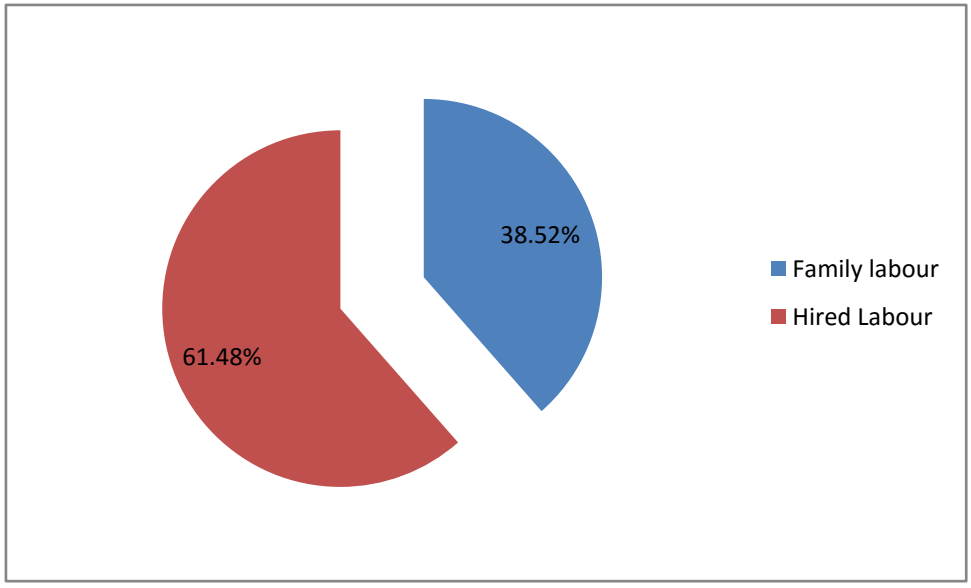
Table 4.3.1

Types of labour	Man day used per farm per season	%
Family labour	310	61.48
Hired labour	194	38.52
Total labour	504	100.00

Source: Field Survey, 2016

1 Man-day = 8 hours

Figure 4.3.6: Labour Distribution



Source: Field Survey, 2016

4.4. Economic Analysis

I. Poultry production:

It was observed that the poultry production varies from farm to farm and depended primarily on the following factors:

a. No of birds at the farm.
b. Mortality rate in the flock.
c. Quality of feed, and
d. Ratio of pure breed supplied.

The study concluded that the average production of a standard poultry farm with 500-1500 birds and mortality rate of 10-14% is around 1,450 kg per month.

II. Poultry prices:

There is frequent price variation in poultry products as well as day old chicks markets. Seasonal price variation is observed in day old chick which ranged from Rs. 42 to 55 i.e. the price was higher in winter season and lower in summer season. Seasonal price fluctuation was mainly attributed by the fact that farming is at peak in winter and lowest in summer and monsoon due to climatic conditions less suitable for poultry farming. Likewise, the prices of poultry birds also varied from time to time and season to season but there is no thumb rule for poultry prices. It

was also observed that the sale prices of produce ranged from Rs. 140 to 160 per kg.

III. *Cost of production:*

Total cost (TC) is defined as the sum of fixed cost (FC) plus variable costs (VC) i.e. TFC+TVC = TC. The total cost of production is calculated to determine the input-output relationship. It was found that all poultry producers incurred both FC and VC but majority of the producers incurred higher VC on poultry production. In addition, variable costs are specific to each household and vary with scale i.e. variable cost has direct relationship with the level of output,

i.e. $VC \propto$ *level of output*

In other words, higher the production (in kg), higher will be the VC (in Rs.). The variable cost primarily includes the cost incurred on:

i. Day old chicks;

ii. Feed;

iii. Vaccination and Medication;

iv. Electricity;

v. Water ;

vi. Disinfectants;

vii. Litter; and

viii. Other day to day expenditure of the farm. These costs are known as the working capital required for the production cycle.

Table 4.4.1: Cost of production of a standard poultry farm (in average)

A) Fixed Costs

- Cost Of Permanent Labor per season — Rs. 30,000
- Construction Of Poultry House per season — Rs. 1,00,000
- Depreciation Cost per season — Rs. 6,000

Total Fixed Cost per season — **Rs. 1, 31,000**

B) Variable Costs

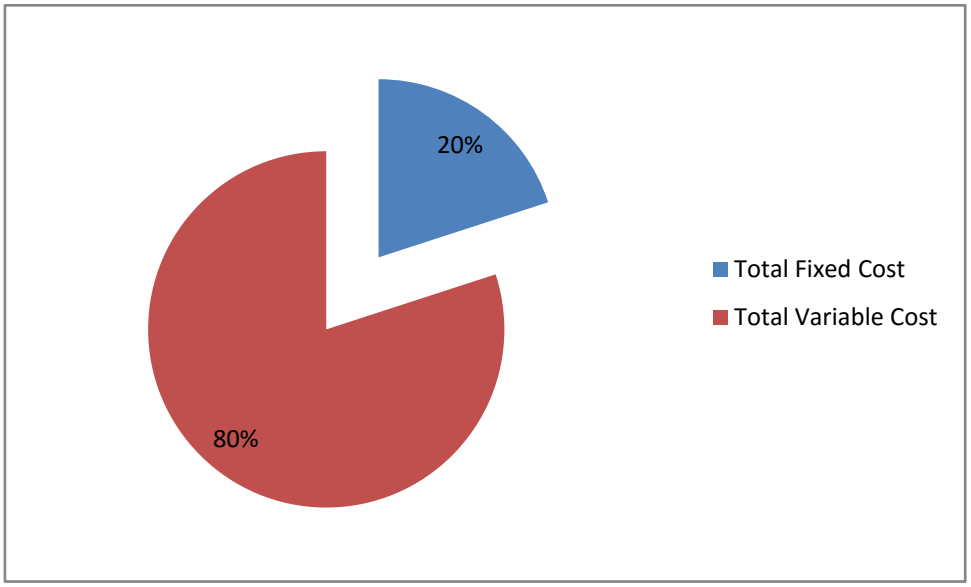
- Price of Batch of Day Old Chick per season — Rs. 1,20,000
- Cost of Feed per season — Rs. 3,60,000
- Cost of Electricity per season — Rs. 5,700
- Cost of Vaccination per season — Rs. 3,750
- Cost of Gas — -
- Cost of Water per season — Rs. 6,000
- Cost of Disinfectants per season — Rs. 1,500
- Cost of Medicine per season — Rs. 3,300

Total Variable Cost per season — **Rs. 5, 00,250**

C) Total Cost (A+B) **Rs. 6, 31,250 per season**

(where one season is a production year which corresponds to three batches of new chicks within 6 months time period).

Figure 4.4.1: Percentage Distribution of Cost



IV. *Profitability analysis*:

Profit maximization is the main goal of a producer. To earn profit producer wants to maximize profit through minimizing cost. The focus of our study is to estimate the costs, returns and finally the profitability of the farm. The relevant cost and returns of the present study are discussed below-

A. Total Cost-

The cost items are classified into two broad categories, i.e,

(i) Fixed cost and

(ii) Variable costs.

Poultry production includes different types of costs under the following heads-

a) Fixed Cost:

1. Housing cost

Housing cost is the most important cost for poultry production. In the present study, some poultry houses were found within the living house and some were outside of the living house. The housing cost is calculated by the summation of total making cost. In the study, average housing cost is Rs. 1 lakh per season.

2. Labour cost

There are broadly two kinds of labour for a poultry farm. They are hired labour and family labour. Here, we have considered hired labour only. The study found that the average labour cost is Rs. 30,000 per season. So, it is a major cost item for poultry farm.

b) Variable Cost:

1. Bird purchasing cost

This cost is the primary cost for the poultry grower. It varies from one farm to another according to the size and numbers. In the

study area, the price of day old chick varied from Rs.42-55. Here, average bird purchasing cost is Rs. 1.2 lakh per season.

2. Feed cost

   Feed cost is a major cost item for poultry farms. In our study area no firm produced their feed inside the farm. All farms purchased feed from contract dealers at a pre-determined price. In the study area, the average feed cost for a season is Rs. 3.6 lakh.

3. Electricity cost

   Electricity is considered a variable cost. If electricity is connected, the bill is paid per month. For a standard farm, the average electricity bill is Rs. 5,700 which raises as the number of birds rises.

4. Veterinary cost

   Veterinary expense is another important cost item of poultry production. Veterinary services included cost of vaccine, medicine, and disinfectants. Total costs were calculated by taking current market prices. Here, the average veterinary cost is Rs. 8,550.

5. Other cost

   Other cost incurred due to sudden occurrences, such as need for extra bird purchase, equipment cost, extra medicine, water and other managerial cost are included here. The average cost is Rs. 6,000.

B. Net Return-

Net return is defined as the difference between total revenue (TR) and total cost (TC) i.e. TR-TC. Net return is determined by subtracting total cost of production from total income per season realized by the poultry producer. The net return is given as-

Table 4.4.2: Net returns of poultry producers (in average)

Items	
• Quantity sold (kg) per season	Rs. 7,500
• Price (Rs/ kg)	Rs. 150
• Total revenue (Rs/ season)	Rs. 11,25,000
• Total cost (Rs/ season)	Rs. 6,31,250
Net returns (Rs/ season)	**Rs. 4, 93, 750**

C. Value of Input to Value of Output Ratio (Total Productivity)-

Total productivity is calculated by dividing values of output by total costs. The input-output ratio is given as-

Table 4.4.3: Value of input to output (returns) without marketing cost

Items	
• Input cost (Rs/ season)	Rs. 6,31,250
• Output (returns) (Rs/ season)	Rs. 4,93, 750
Ratio	**1.28**

The ratio of 1.28 implies that poultry farming has a low total productivity level (as compared to other poultry farms elsewhere on both developing and developed countries studied under the review of literature).

D. Value of Total Revenue by Total Cost (Benefit-Cost Ratio)-

The ratio of the value of total revenue to total cost is calculated. The BCR ratio is given as-

Table 4.4.4: Value of total revenue to total cost

Items	
• Revenue (Rs/ season)	Rs. 11,25,000
• Cost (Rs/ season)	Rs. 6,31,250
Ratio	**1.78**

The ratio of 1.78 implies that poultry business in Samtlang is viable and capable of offsetting its own cost (a ratio of greater than one indicates that the project is a viable one).

4.5. Proof of Hypothesis

The null hypothesis is- There is a positive correlation between Production and Farm input.

Let us consider the following production function-

$$Farm\ Production = f\ (Farm\ inputs)$$

or

$$Total\ Revenue = f\ (Total\ Variable\ Cost)$$

(since TFC is fixed and does not fluctuate)

The estimated coefficient of correlation and linear regression between production and input of a standard poultry farm shows the following result:

$$Y = -35916 + 2.859X$$

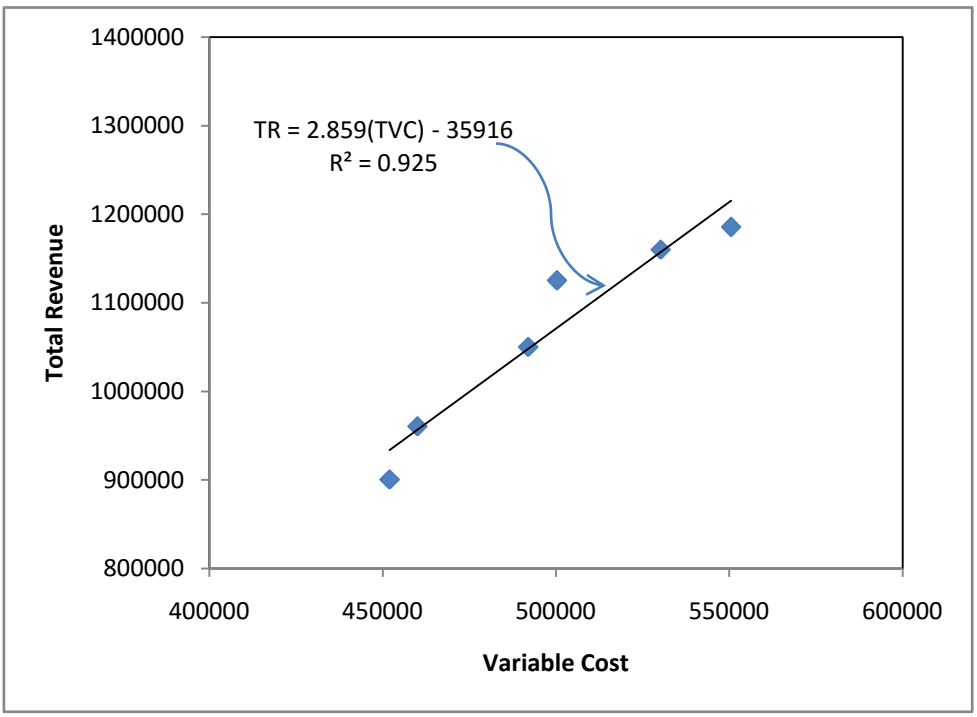
where,

Y is the Total Revenue (TR) and

X is the Total Variable Cost (TVC).

A scatter diagram of the above linear regression is shown in Figure 4.5.1.

Figure 4.5.1



Source: Field Survey, 2016

Table 4.5.1 Regression Analysis between TR and TVC

Model	R	R Square	Adjusted R Square	Std. Error
1	.962	0.92	0.906	34891

Source: Field Survey, 2016

It is observed from table 4.5.1 that the value of R (the correlation coefficient) is 0.962, which is almost +1 indicating a significant correlation between TR and TVC. Since R Square is 0.92, it indicates that 92% of the total variation in TR

is explained by the change in TVC. Further, the significantly positive slope coefficient (2.85) of the equation denotes that the TR is directly related to the TVC. Thus, TR and TVC are directly and positively correlated.

CHAPTER 5

MAJOR FINDINGS, SUGGESTIONS AND CONCLUSION

5.1 Major findings of the study

The major findings of the research study based on the result of analysis of both primary and secondary data are as under. The following findings have been drawn:

1. *Age of the respondents:*

   The data on age group of the sampled poultry farmers revealed that 56% respondents fall in the age group of 36-45 years, 30% in the age group of 46-55, 12% in the age group of 56-65 years, and 2% respondents fall within the age group of 26-35 years.

2. *Education level:*

   About 45% of the respondents had Secondary education, 10% had University degree, 0% had Intermediate diploma while the percentage of Primary, Read and Write and Illiterate was 30%, 15% and 0%, respectively.

3. *Poultry farming experience:* About 51% of the respondent farmers had poultry farming experience of 7-10 years. This was followed by 38% and 11% of respondents who had experience of 4-5 and 1-3 years, respectively.

4. *Scale of poultry business:*

   In order to examine the resource management and its impact on productivity and sustainability, the Poultry producers were divided into four groups on the basis of number of birds: a) Less than 500; b) From 500-1000 ; c) from 1001-1500 ; and d) from 1501 and above. The results revealed that 65% of the respondents belonged to group (b); 30% respondents were in group (c); and 5% of the respondents were in group (a) and (d).

5. *Business commitment:*

   About 68% belonged to full-time whereas 32% belonged to part-time business commitment. The study found that the poultry farms were primarily owned and operated by the male head whereas the contributions of women were either negligible or at best supplementary.

6. *Access to credit:*

   Access to credit is an important instrument that enables farmers to acquire working capital and inputs. Credit availability for small farmers is one of the main indicators of rural development. But in case of poultry farming, only about 30%

availed the institutional credit from bank, while 70% did not borrow loan from any bank. It was also found that 80% respondent farmers purchased the feed on credit from the feed dealers and the remaining percent purchased it on cash. Of the farmers who purchased poultry feed on credit, about 40% reported shortage of requisite capital while the remaining 60% viewed it as routine of poultry farming business.

7. *Labor utilization*:

Poultry sector can generate employment by using family labor as well as hired labor. The survey also collected information of labor use for poultry production activity. Table 4.3.1 presents the information of labor utilization of contract poultry farm. It appears from the Table that total labor man-days per farm were 505 of which 39 per cent man-days was family labor and 61 per cent man-days was hired labor.

8. Poultry production:

It was observed that the poultry production varies from farm to farm and depended primarily on the following factors:

a. No of birds at the farm.
b. Mortality rate in the flock.
c. Quality of feed, and
d. Ratio of pure breed supplied.

The study concluded that the average production of a standard poultry farm with 500-1500 birds and mortality rate of 10-14% is around 1,450 kg per month.

9. *Poultry prices:*

There is frequent price variation in poultry products as well as day old chicks markets. Seasonal price variation is observed in day old chick which ranged from Rs. 42 to 55 i.e. the price was higher in winter season and lower in summer season. Seasonal price fluctuation was mainly attributed by the fact that farming is at peak in winter and lowest in summer and monsoon due to climatic conditions less suitable for poultry farming. Likewise, the prices of poultry birds also varied from time to time and season to season but there is no thumb rule for poultry prices. It was also observed that the sale prices of produce ranged from Rs. 140 to 160 per kg.

10. *Cost of production:*

Total cost (TC) is defined as the sum of fixed cost (FC) plus variable costs (VC) i.e. TFC+TVC = TC. The total cost of production is calculated to determine the input-output relationship. It was found that all poultry producers incurred both FC and VC but majority of the producers incurred higher VC on poultry production. In addition, variable costs are specific to each household and vary with scale i.e. variable cost has direct relationship with the level of output,

i.e. *VC α level of output*

In other words, higher the production (in kg), higher will be the VC (in Rs.). The variable cost primarily includes the cost incurred on:

a. Day old chicks;

b. Feed;

c. Vaccination and Medication;

d. Electricity;

e. Water ;

f. Disinfectants;

g. Litter; and

h. Other day to day expenditure of the farm. These costs are known as the working capital required for the production cycle.

11. Housing cost:

Housing cost is the most important cost for poultry production. In the present study, some poultry houses were found within the living house and some were outside of the living house. The housing cost is calculated by the summation of total making cost. In the study, average housing cost is Rs. 1 lakh per season.

12. *Labour cost:*

There are broadly two kinds of labour for a poultry farm. They are hired labour and family labour. Here, we have considered hired labour only. The study found that the average labour cost is Rs. 30,000 per season. So, it is a major cost item for poultry farm.

13. *Bird purchasing cost:*

This cost is the primary cost for the poultry grower. It varies from one farm to another according to the size and numbers. In the study area, the price of day old chick varied from Rs.42-55. Here, average bird purchasing cost is Rs. 1.2 lakh per season.

14. *Feed cost:*

Feed cost is a major cost item for poultry farms. In our study area no firm produced their feed inside the farm. All farms purchased feed from contract dealers at a pre-determined price. In the study area, the average feed cost for a season is Rs. 3.6 lakh.

15. *Electricity cost:*

Electricity is considered a variable cost. If electricity is connected, the bill is paid per month. For a standard farm, the average electricity bill is Rs. 5,700 which raises as the number of birds rises.

16. *Veterinary cost:*

Veterinary expense is another important cost item of poultry production. Veterinary services included cost of vaccine, medicine, and disinfectants. Total costs were calculated by taking current market prices. Here, the average veterinary cost is Rs. 8,550.

17. *Other cost:*

Other cost incurred due to sudden occurrences, such as need for extra bird purchase, equipment cost, extra medicine, water and other managerial cost are included here. The average cost is Rs. 6,000.

18. *Net Return:*

Net return is defined as the difference between total revenue (TR) and total cost (TC) i.e. TR-TC. Net return is determined by subtracting total cost of production from total income per season realized by the poultry producer. The net return is Rs. 4, 93, 750

19. *Value of Input to Value of Output Ratio (Total Productivity):*

Total productivity is calculated by dividing values of output by total costs. The input-output ratio is 1.28. The ratio of 1.28 implies that poultry farming has a low total productivity level (as compared to other poultry farms elsewhere on both developing and developed countries studied under the review of literature).

20. *Value of Total Revenue by Total Cost (Benefit-Cost Ratio):*

The ratio of the value of total revenue to total cost is calculated. The BCR ratio is 1.78. The ratio of 1.78 implies that poultry business in Samtlang is viable and capable of offsetting its own cost (a ratio of greater than one indicates that the project is a viable one).

21. *Proof of Hypothesis:*

It is observed that the value of R (the correlation coefficient) is 0.962, which is almost +1 indicating a significant correlation between TR and TVC. Since R Square is 0.92, it indicates that 92% of the total variation in TR is explained by the change in TVC. Further, the significantly positive slope coefficient (2.85) of the linear regression equation denotes that the TR is directly related to the TVC. Thus, TR and TVC are directly and positively correlated.

5.2 Suggestions and conclusions

The economic analysis of poultry has been carried out on the basis of primary data collected from Samtlang village in Aizawl. It was found that majority poultry farmers have adopted this business as a primary source of their income and fall in the category of small group (500 - 1500 birds).

The following can be concluded from the above findings:

1. *Vertically Integrated Contract Poultry Farming System in Samtlang*: The term 'Contract' in broiler production may vary from country to country and the nature of the integrator company. In the context of Mizoram, contract in broiler production means agreements between farmers and integrators that specify conditions of producing and marketing broiler. There are generally two types of contracts-Production contracts and Marketing contracts. Production contracts the quality and quantity of broiler inputs to be determined and supplied by the contracting firm. The type of compensation that the grower will receive for services is also decided by the contractor. In case of marketing, contract refers to agreements between a contractor and a grower that sets a price and the market outlet for the broiler before the broiler is ready to be marketed. Most management decisions remain with the grower. In marketing contract, only price risk is shared whereas in production contract, both production and price risk are shared by the grower and contractor. The contractor may have more control over production decisions depending on the type of production contract. The poultry farming

system adopted in Samtlang according to the study is based on production contract.

2. *Incentives for Contract farmer*: According to the study, the farmer's decision to enter in contract has been motivated by some benefits or incentives from contracting. Risk and uncertainty are common facts of poultry business. The primary constraints faced by farmers are-
    a. lack of capital,
    b. inadequate knowledge of poultry rearing,
    c. outbreak of diseases,
    d. inadequate availability of inputs,
    e. inadequate institutional credit, and
    f. absence of guaranteed and profitable markets for inputs.

3. *Credit facility*: From the study, it can be concluded that majority of the farmers are financially weak. They are forced to rely on non-institutional source of credit due to the limited credit facility extended by the financial institutions.

4. *Year on Year (YoY) Input–Output price variation*: The YoY Input-Output price variation of the time period under study is found to be high and fluctuating resulting in the destabilization of the farmers' income.

5. *Marginal Efficiency of Capital*: Although, the farmers have managed to keep the mortality rate on lower side under normal circumstances, the marginal efficiency of the capital is not promising for investors due to the high cost of production. At the same time, in our study area, about 75% of farmers face acute financial and capital problems. In this way, the vicious circle reinforced itself.

6. *Employment and Poverty alleviation*: Poultry farming is an important segment of agriculture. The farmers in Samtlang, at present, constitute a number of educated unemployed, semi-literate and semi-skilled persons who are engaged in poultry farming. In this way, poultry sector plays an important role in solving poverty, unemployment and malnutrition problem.

7. *Technical knowledge*: Farmers should have technical knowledge to run a poultry farm. The study however found that most of the poultry farmers started this business without being proper trained. Facilities to train up poultry farmers on various aspects of poultry farming are largely absent or unavailable. The farmers in many cases are not in touch with modern technology to augment production. Inadequate knowledge about poultry diets is also found to be a major problem.

8. Recommendations:

The following recommendations are put forwarded based on the findings and experiences gained through field study-

a. To reduce cost of production, farmers should form agricultural cooperative groups which will enable them to benefit from the economy of scale through bulk purchases of farm inputs.
b. Government should encourage the youths involved by providing them technical education in the area of resource management through the extension agents to reduce production cost.
c. Subsidization of feeds, drugs, and vaccine to poultry farmers is in the right direction and should be intensified to benefit large farmers at the right time to reduce the stress and cost of production in order to improve profitability.
d. The Ministry of Agriculture should establish or assist the private sector in establishment of commercial hatcheries to ensure the availability of day old chick on cheaper prices to reduce the cost of production of poultry farmers, and
e. Poultry sale price may be fixed on weekly or fortnightly basis in consultation with producers.

To conclude, a farmer's decision to enter into a contract and his or her successful participation in it will lead to increase revenue and reducing risk exposure. The results suggested that in the study area, most of the contract farmers are under small farm category and the vertically integrated contract system is a substantially

profitable farming system when compared to independent farming. Contract farming offers many incentives for farmers, including access to new markets, technical assistance, specialized inputs, and financial support. The study has found that vertically integrated contract farming system reduces price risk and a part of production risk due to mortality was shared with the integrator. Moreover, contract farmers were also assured of more stabilized prices even during period of low demand. So, it could be concluded that well-organized vertically integrated poultry farming has been and in the future could be a feasible approach to increase poultry production in Samtlang in particular and Mizoram in general.

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